

Air Cylinders

Series C76

ø32, ø40



| |
|------------|
| CJ1 |
| CJP |
| CJ2 |
| CM2 |
| CG1 |
| MB |
| MB1 |
| CA2 |
| CS1 |
| C76 |
| C85 |
| C95 |
| CP95 |
| NCM |
| NCA |
| D- |
| -X |
| 20- |
| Data |

Standard Type, Non-rotating Rod Type, Direct Mount Type

Series C76: $\varnothing 32$, $\varnothing 40$

Easy-accurate Mounting

Simple space-saving design with high dimensional accuracy makes these cylinders very easy to use.
Large spanner flats on the rod and head covers greatly simplify their installation and positioning.

High Speed Actuation

Low friction and the standard elastomer cushion seals allow piston speeds up to 1500 mm/s. Either rubber bumper or air cushions are available.

Replaceable Rod Seal

Rod seal can be quickly replaced, greatly extending the cylinder life.

Strong, Corrosion-proof Barrel

The risk of breakage or deformation due to external impacts is reduced by the use of harder, heavy walled stainless steel tube.

Minimized Side Clearance

The close tolerance of the piston rod in the front end bush allows greater side loading.

(Head cover)

Three different head covers offer space saving convenience

Double end

Front nose

Front nose in line port

Double end

Front nose

Front nose in line port

| Series | Type | Action | Bore size (mm) | 32 | 40 | Rod boot |
|--------|------------------|--------------------------------|----------------|----|----|----------|
| C76 | Standard | Double acting, Single rod | ● | ● | ● | ● |
| | | Double acting, Double rod | ● | ● | ● | ● |
| | | Single acting, Spring return | ● | ● | ● | ● |
| | | Single acting, Spring extended | ● | ● | ● | ● |
| | | Double acting, Single rod | ● | ● | ● | ● |
| | | Single acting, Spring return | ● | ● | ● | ● |
| | Non-rotating rod | Single acting, Spring extended | ● | ● | ● | ● |
| | | Double acting, Single rod | ● | ● | ● | ● |
| | | Single acting, Spring return | ● | ● | ● | ● |
| | Direct mount | Single acting, Spring extended | ● | ● | ● | ● |
| | | Double acting, Single rod | ● | ● | ● | ● |
| | Mounting bracket | Rod foot /Rod flange (Single) | ● | ● | ● | ● |
| | | Rod and head foot (Double) | ● | ● | ● | ● |
| | | Rod trunnion | ● | ● | ● | ● |
| | | Head trunnion | ● | ● | ● | ● |
| | | Rod clevis | ● | ● | ● | ● |
| | | Head clevis | ● | ● | ● | ● |

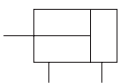
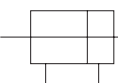
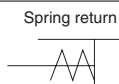
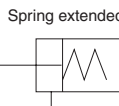
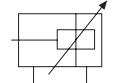
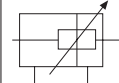
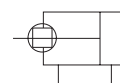
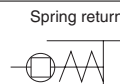
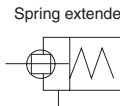
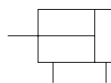
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Recommendable combination

Note 1) No double acting, double rod

Note 2) Except with air cushion

Series Variations

| | Standard (Rubber bumper) | | | Standard (Air cushion) | | Non-rotating rod | | Direct mount |
|-----------------------|--|---|---|--|---|--|---|--|
| | Double acting, Single rod | Double acting, Double rod | Single acting, Spring return/ Spring extended | Double acting, Single rod | Double acting, Double rod | Double acting, Single rod | Single acting, Spring return/ Spring extended | Double acting, Single rod |
| |  |  | <div>Spring return</div>  <div>Spring extended</div>  |  |  |  | <div>Spring return</div>  <div>Spring extended</div>  |  |
| Bore size (mm) | 32, 40 | | | 32, 40 | | 32, 40 | 32, 40 | 32, 40 |
| Type | Non-lube | | | | | | | |
| Mounting (Head cover) | Double end Front nose Front nose in line port | Double end | Spring return Double end Front nose Front nose in line port Spring extended Double end Front nose | Double end | Double end | Double end Front nose Front nose in line port | Spring return Double end Front nose Front nose in line port Spring extended Double end Front nose | Boss-cut |
| Built-in magnet | Band mounting type, Rail mounting type | | | | | | | Band mounting type |
| Mounting bracket | Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis | Rod and head foot Flange Trunnion | Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis | Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis | Rod and head foot Flange Trunnion | Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis | | Bottom side mounting Front side mounting |
| Accessory | Standard Mounting nut Rod end nut Option Single knuckle joint Double knuckle joint (With pin) Floating joint | | Standard Mounting nut Rod end nut Option Single knuckle joint Double knuckle joint (With pin) Floating joint | Standard Mounting nut Rod end nut Option Single knuckle joint Double knuckle joint (With pin) Floating joint | | Standard Mounting nut Rod end nut Option Single knuckle joint Double knuckle joint (With pin) Floating joint | | Standard Rod end nut Option Single knuckle joint Double knuckle joint (With pin) Floating joint |
| Page | 6-10-5 | | 6-10-19 | 6-10-5 | | 6-10-5 | 6-10-19 | 6-10-37 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C76

Stroke Selection

The relation between the cylinder size and the maximum stroke depending on the mounting style

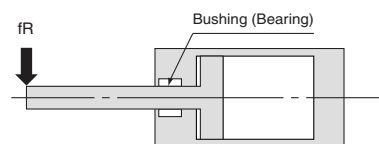
Assuming that the force that is generated by the cylinder itself acts as a buckling force on the piston rod or on the piston rod and the cylinder tube, the table below indicates in centimeters the maximum stroke that can be used, which was obtained through calculation. Therefore, it is possible to find the maximum stroke that can be used with each cylinder size according to the relationship between the level of the operating pressure and the type of cylinder mounting, regardless of the load factor.



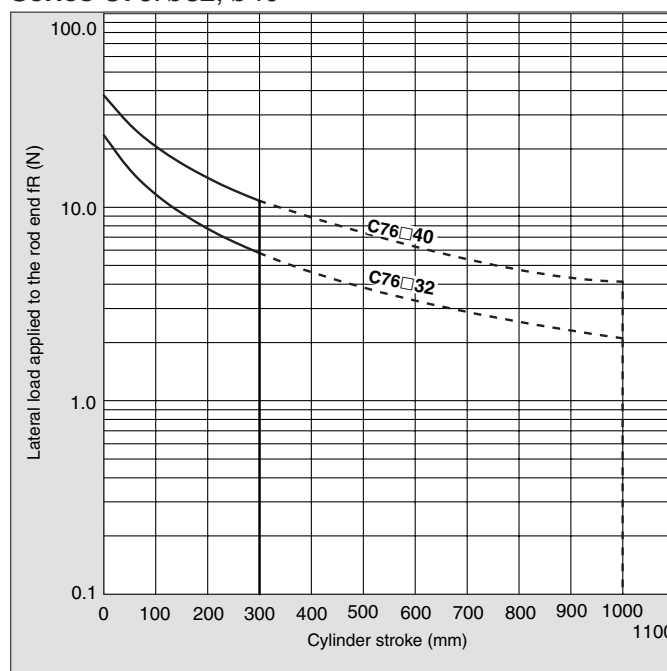
Reference: Even under a light load, if the piston rod has been stopped by an external stopper at the extending side of the cylinder, the maximum force generated by the cylinder will act upon the cylinder itself.

The maximum stroke at which the cylinder can be operated under a lateral load

The region that does not exceed the bold solid line represents the allowable lateral load in relation to the cylinder of a given stroke length. In the graph, the range of the broken line shows that the long stroke limit has been exceeded. In this region, as a rule, operate the cylinder by providing a guide along the direction of movement.



Series C76: $\phi 32$, $\phi 40$



| Mounting style | | | Nominal symbol | Operating pressure (MPa) | Maximum stroke that can be used according to buckling strength | | |
|-----------------------------|-------------------------|------------------------|----------------|-----------------------------|---|--------|--------|
| Mounting bracket diagram | | | | | C76 | | |
| | | | | | 32 | 40 | |
| Foot: L | Rod side flange: F | Head side flange: G | | L F | 0.3 | 54 | 58 |
| | | 0.5 | | | 40 | 44 | |
| | | 0.7 | | | 33 | 36 | |
| | | G | 0.3 | 23 | 24 | | |
| 0.5 | 16 | | 17 | | | | |
| 0.7 | 13 | | 13 | | | | |
| Clevis: C, D | Rod side trunnion: U | | C D | 0.3 | — | — | |
| | 0.5 | | | — | — | | |
| | 0.7 | | | — | — | | |
| | U | 0.3 | (100)* | (100)* | | | |
| 0.5 | | 85 | 92 | | | | |
| 0.7 | | 71 | 77 | | | | |
| Head side trunnion: U | Center trunnion: O | | T | 0.3 | 53 | 57 | |
| Series CS1 only | | | | 0.5 | 40 | 43 | |
| | | | | 0.7 | 33 | 35 | |
| Foot: L | Rod side flange: F | Head side flange: G | | L F | 0.3 | (100)* | (100)* |
| | | 0.5 | | | (100)* | (100)* | |
| | | 0.7 | | | (100)* | (100)* | |
| | | G | 0.3 | 77 | 83 | | |
| 0.5 | 58 | | 63 | | | | |
| 0.7 | 48 | | 52 | | | | |
| Foot: L | Rod side flange: F | Head side flange: G | | L F | 0.3 | (100)* | (100)* |
| | | 0.5 | | | (100)* | (100)* | |
| | | 0.7 | | | (100)* | (100)* | |
| | | G | 0.3 | (100)* | (100)* | | |
| 0.5 | 86 | | 92 | | | | |
| 0.7 | 71 | | 77 | | | | |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod

Series C76

ø32, ø40

How to Order

Double acting Single rod

Double acting Double rod

Built-in magnet

| | |
|-----|-----------------|
| Nil | None |
| D | Built-in magnet |

Type

| | |
|-----|--|
| Nil | Standard |
| K | Non-rotating rod (Rubber cushion only) |

Mounting style

| Symbol | Mounting |
|--------|-------------------------|
| E* | Double end |
| F** | Front nose |
| Y** | Front nose in line port |

* Double acting, Double rod type: Only double end type. (E)
** Except air cushion type.

Auto switch mounting type

| | |
|---|---------------|
| A | Rail mounting |
| B | Band mounting |

Applicable auto switches and bands are shown on pages 6-10-45 to 6-10-46. Please order auto switches and bands separately.

Option

| | |
|----|--|
| R | Stainless steel piston rod, rod end nut and mounting nut |
| R2 | Stainless steel piston rod and rod end nut |

Note) Please refer to page 6-10-46 for additional options. Only one option can be selected.

Rod boot

| | |
|-----|-------------------------------------|
| Nil | Without rod boot |
| J | Nylon tarpaulin one side |
| K | Heat resistant tarpaulin one side |
| JJ* | Nylon tarpaulin both sides |
| KK* | Heat resistant tarpaulin both sides |

* In the case of double acting/double rod.

Cushion

| | |
|-----|----------------------------------|
| Nil | Rubber cushion (Standard) |
| C | Air cushion (Only "E" execution) |

Bore size

| Bore size (mm) | Standard stroke (mm) | Max. stroke (mm) |
|----------------|--------------------------|------------------|
| 32 | 10, 25, 40, 50, 80, 100, | 1000 |
| 40 | 125, 160, 200, 250, 300 | |

Mounting Bracket Part No.

| Bore size (mm) | | 32 | 40 |
|------------------|---|-------------|-------------|
| Mounting bracket | Flange, Foot (1 pc.) | C76F32A | C76F40A |
| | Flange, Foot (2 pcs. with mounting nut 1 pc.) | C76F32B | C76F40B |
| | Trunnion | C76T32 | C76T40 |
| | Clevis | C76C32 | C76C40 |
| Accessory | Single knuckle joint | KJ10DA | KJ12DA |
| | Double knuckle joint | GKM10-20A | GKM12-24A |
| | Floating joint | JA25-10-150 | JA40-12-175 |

Replacement Parts

| Bore size (mm) | Part no. | | Note |
|----------------|----------|--------------|--|
| | Standard | Non-rotating | |
| 32 | C76-32PS | C76K-32PS | Every set includes: 1 rod seal 1 seal retaining washer 1 retaining ring |
| 40 | C76-40PS | C76K-40PS | |

Suitable also C76 series

Example of How to Order

- Cylinder without auto switch, Bore size: 32, Stroke: 100, Double acting/Single rod and Double end type.
C76E32-100 1 pc. Cylinder
- Cylinder without auto switch, Bore size: 32, Stroke: 50, Double acting/Double rod type and Rod and head foot mounting.
C76WE32-50 1 pc. Cylinder
C76F32B 2 pcs. Foot bracket
- Cylinder with auto switch (Band mounted type, 2 pcs.), Bore size: 40, Stroke: 100, Double acting/Single rod, Front nose in line port type and Flange mounting.
CD76Y40-100-B 1 pc. Cylinder
C76F40A 1 pc. Flange mounting
D-C73L 2 pcs. Auto switch
BM2-040 2 pcs. For auto switch mounting band
- Cylinder with auto switch (Rail mounted type, 2 pcs.), Bore size: 40, Stroke: 50, Single acting/Spring return, Front nose type and Trunnion mounting.
CD76F40-50S-A 1 pc. Cylinder
C76T40 1 pc. Trunnion mounting
D-A73L 2 pcs. Auto switch
- Non-rotating: Cylinder without auto switch, Bore size: 32, Stroke: 100, Double acting/Single rod and Double end type.
C76KE32-100 1 pc. Cylinder

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

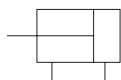
Series C76



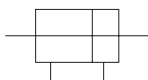
JIS Symbol

Standard: Double acting

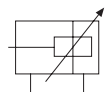
Rubber bumper
Single rod



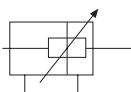
Rubber bumper
Double rod



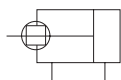
Air cushion
Single rod



Air cushion
Double rod



Non-rotating: Double acting, Single rod



Specifications

| Bore size (mm) | | 32 | 40 |
|-------------------------------|--------------------------|--|------------|
| Piston rod dia. (mm) | | 12 | 14 |
| Piston rod thread | | M10 x 1.5 | M12 x 1.75 |
| Port size | | G 1/8 | G 1/4 |
| Action | | Double acting, Single/Double rod | |
| Fluid | | Air | |
| Proof pressure | | 1.5 MPa | |
| Max. operating pressure | | 1.0 MPa | |
| Min. operating pressure | | 0.05 MPa | |
| Ambient and fluid temperature | | -20 to 80°C (Built-in magnet type: -10 to 60°C) | |
| Cushion | | Rubber cushion, Air cushion | |
| Lubrication | | Not required. Use turbine oil Class 1 ISO VG32, if lubricated. | |
| Rod boot | Nylon tarpaulin | Max. ambient temperature 60°C | |
| | Heat resistant tarpaulin | Max. ambient temperature 110°C * | |
| Piston speed | | 50 to 1500 mm/s | |
| Allowable kinetic energy | Rubber cushion | 0.65J | 1.2J |
| | Air cushion | 1.07J | 2.35J |
| Non-rotating accuracy | | ±0.5° | ±0.5° |
| Stroke tolerance (mm) | | 0/+1.4 | |

* Maximum ambient temperature of rod boots only.

Weight (Standard, Non-rotating)

(g)

| Bore size (mm) | | 32 | 40 | |
|--|----------------------|-----------|-----------|-----|
| Basic weight | Single rod | 340 (375) | 655 (725) | |
| | Double rod | 420 | 810 | |
| Additional weight for each 10 mm of stroke | Single rod | 16.8 | 26.6 | |
| | Double rod | 25.6 | 96.5 | |
| Mounting bracket | C75F□A | 110 | 200 | |
| | C75F□B | 240 | 455 | |
| | C75T□ | 15 | 25 | |
| | C85C□ | 165 | 305 | |
| Accessory | Single knuckle joint | KJ□D | 70 | 105 |
| | Double knuckle joint | GKM□-□ | 100 | 165 |
| | Floating joint | JA□-□-□ | 70 | 160 |

Calculation: (Example) C76E32-50, C76F32A
 Basic weight 340 (ø32) g
 Additional weight 16.8/10 mm of stroke
 Cylinder stroke 50 mm
 Mounting bracket 110 g
 340 + 16.8 x 50/10 = 424 g 424 + 110 = 534 g

() : In the case of air cushion

Auto Switch Mounting, Minimum Possible Cylinder Stroke

Band Mounting Type

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|--------------|---|------------------|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $50 + 45(n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50(\frac{n-2}{2})$ (n = 2, 4...) | $65 + 50(n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $60 + 45(n - 2)$ | 10 |

Rail Mounting Type

(mm)

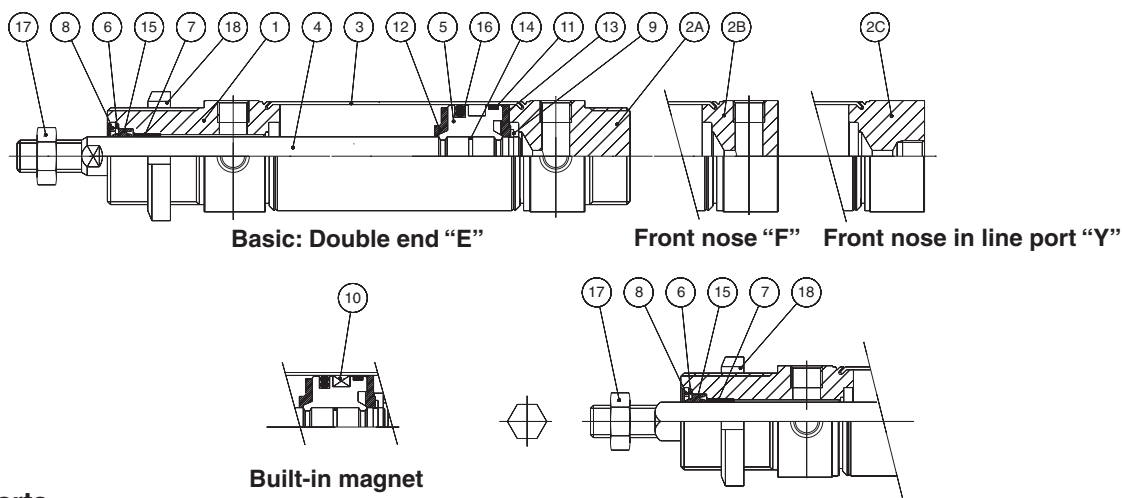
| Auto switch model | No. of auto switches | | | | 1 pc. |
|---|----------------------|--------------|--------------------|---|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-A7□/A80 D-A7□H/A80H D-A73C/A80C D-F7□/F7□V D-J79/J79C | — | 10 | — | $10 + 35(\frac{n-2}{2})$ (n = 2, 4...) | 5 |
| D-A79W, D-J79W D-F7□W, D-F7BAL D-F79F, F7□WV D-F7BAVL | — | 15 | — | $15 + 35(\frac{n-2}{2})$ (n = 2, 4...) | 10 |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

Construction

[First angle projection]

Double acting, Single rod C□76□32 to 40 Rubber cushion

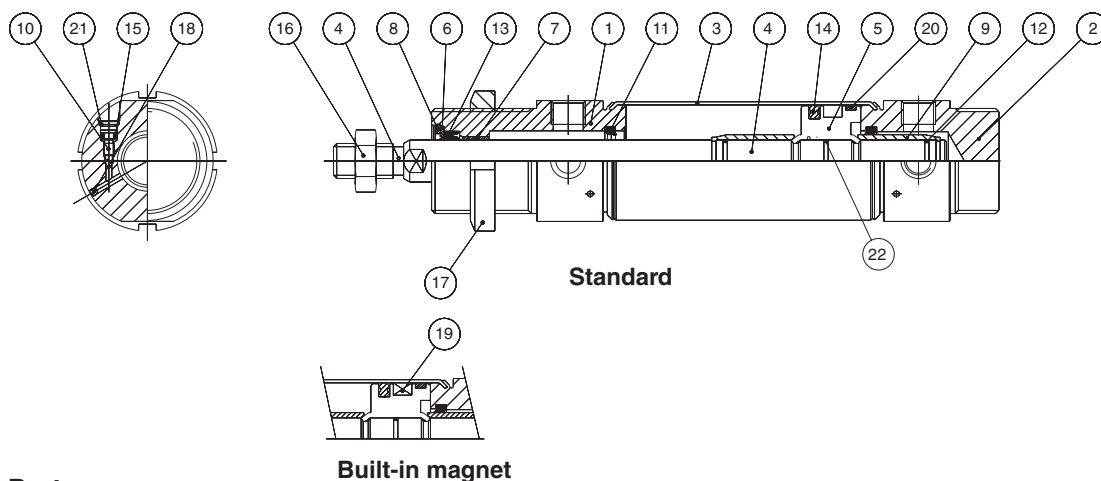


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover E | Aluminum alloy | 1 | White anodized |
| ②B | Head cover F | Aluminum alloy | 1 | White anodized |
| ②C | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ⑨ | Retaining ring | Stainless steel | 1 | |
| ⑩ | Magnet | Magnet | 1 | (Switch type only) |
| ⑪ | Wear ring | Resin | 1 | |
| ⑫ | Bumper A | Urethane | 1 | |
| ⑬ | Bumper B | Urethane | 1 | |
| ⑭ | Piston gasket | NBR | 1 | |
| ⑮ | Rod seal | NBR | 1 | |
| ⑯ | Piston seal | NBR | 1 | |
| ⑰ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑱ | Mounting nut | Carbon steel | 1 | Nickel plating |

C□76□32 to 40 Air cushion



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|----------------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ② | Head cover E | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑨ | Cushion ring | Brass | 2 | |
| ⑩ | Cushion needle | Alloy steel | 2 | Electroless nickel plating |
| ⑪ | Cushion seal | Urethane | 2 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------------|-----------------|------|--------------------|
| ⑫ | Cushion ring gasket | NBR | 2 | |
| ⑬ | Rod seal | NBR | 1 | |
| ⑭ | Piston seal | NBR | 1 | |
| ⑮ | Cushion needle seal | NBR | 1 | |
| ⑯ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑰ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑱ | Steel ball | Stainless steel | 2 | |
| ⑲ | Magnet | Magnet | 1 | (Switch type only) |
| ⑳ | Wear ring | Resin | 1 | |
| ㉑ | Self locking ring | Stainless steel | 2 | |
| ㉒ | Piston gasket | NBR | 1 | |

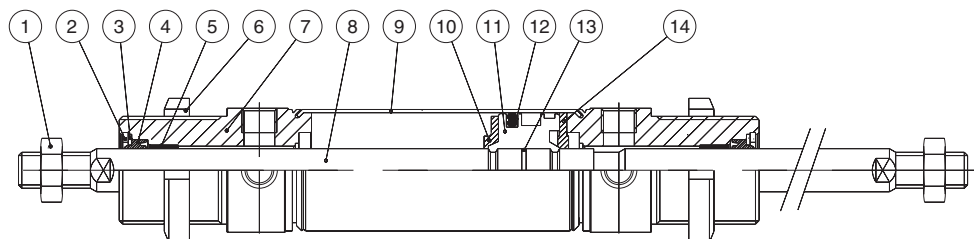
Series C76

Construction

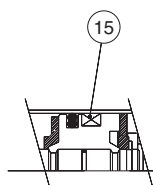
[First angle projection]

Double acting, Double Rod

C□76□32 to 40 Rubber bumper



Standard



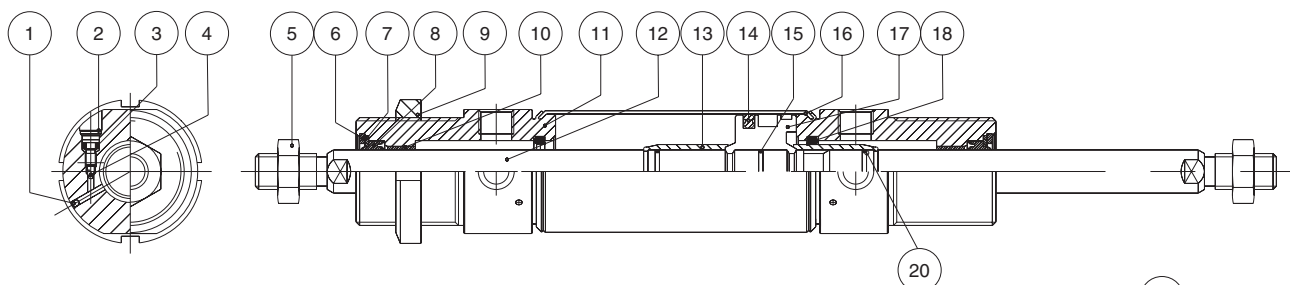
Built-in magnet

Component Parts

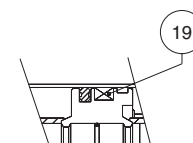
| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod end nut | Carbon steel | 1 | Nickel plating |
| ② | Retaining ring | Carbon steel | 2 | Nickel plating |
| ③ | Plain washer | Stainless steel | 2 | |
| ④ | Rod seal | NBR | 2 | |
| ⑤ | Bush | Sintered bronze | 2 | |
| ⑥ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑦ | Rod cover | Aluminum alloy | 2 | White anodized |
| ⑧ | Piston rod | Carbon steel | 1 | Hard chrome plated |

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|--------------------|
| ⑨ | Cylinder tube | Stainless steel | 1 | |
| ⑩ | Bumper A | Urethane | 1 | |
| ⑪ | Piston | Aluminum alloy | 1 | Chromate |
| ⑫ | Piston seal | NBR | 1 | |
| ⑬ | Piston gasket | NBR | 1 | |
| ⑭ | Bumper B | Urethane | 1 | |
| ⑮ | Magnet | Magnet | 1 | (Switch type only) |

C□76□32 to 40 Air cushion



Standard



Built-in magnet

Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------------|-----------------|------|---------------------------|
| ① | Steel ball | Stainless steel | 2 | |
| ② | Self locking ring | Stainless steel | 2 | |
| ③ | Cushion needle seal | NBR | 2 | |
| ④ | Cushion needle | Alloy steel | 2 | Electroless nickel plated |
| ⑤ | Rod end nut | Carbon steel | 2 | Nickel plating |
| ⑥ | Retaining ring | Carbon steel | 2 | Nickel plating |
| ⑦ | Plain washer | Stainless steel | 2 | |
| ⑧ | Rod seal | NBR | 2 | |
| ⑨ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑩ | Bush | Sintered bronze | 2 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------------|-----------------|------|--------------------|
| ⑪ | Rod cover | Aluminum alloy | 2 | White anodized |
| ⑫ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑬ | Cushion ring | Brass | 2 | |
| ⑭ | Piston seal | NBR | 1 | |
| ⑮ | Piston gasket | NBR | 1 | |
| ⑯ | Cylinder tube | Stainless steel | 1 | |
| ⑰ | Piston | Aluminum alloy | 1 | Chromate |
| ⑱ | Cushion seal | Urethane | 2 | |
| ⑲ | Magnet | Magnet | 1 | (Switch type only) |
| ⑳ | Cushion ring gasket | NBR | 2 | |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

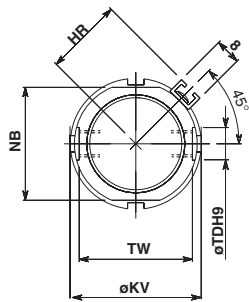
Dimensions

[First angle projection]

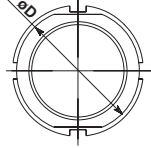
Double acting, Single rod

Rubber cushion: C□76E **Bore** **Stroke** □

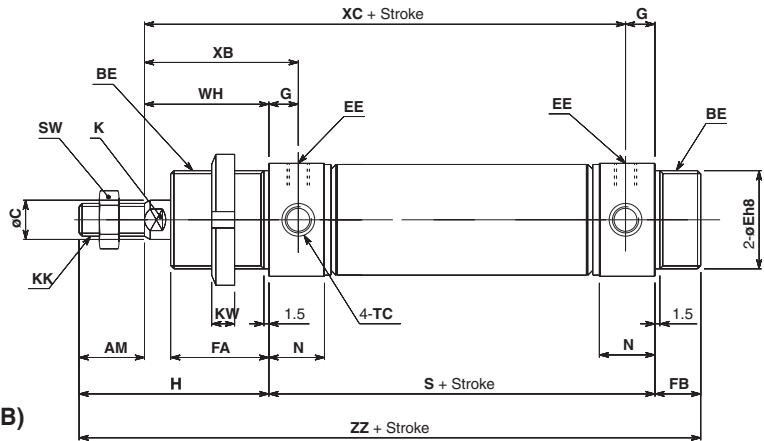
Without magnet, Built-in magnet



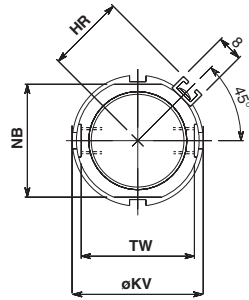
Rail mounting type (A)



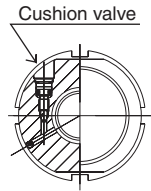
Band mounting type (B)
or non-magnet



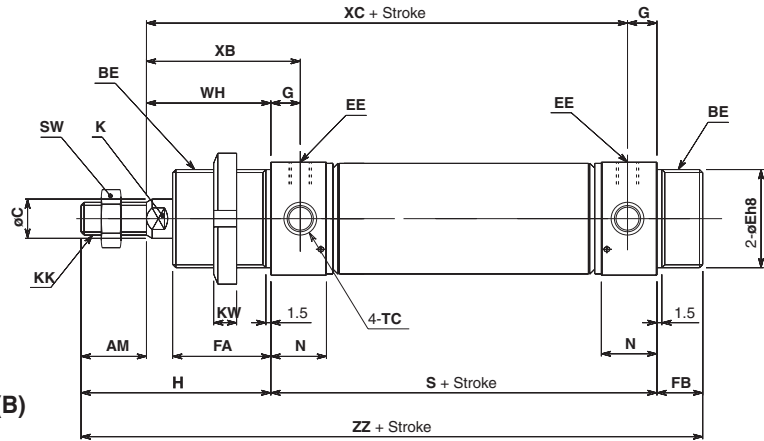
Air cushion: C□76E **Bore** **Stroke** C-□
Without magnet, Built-in magnet



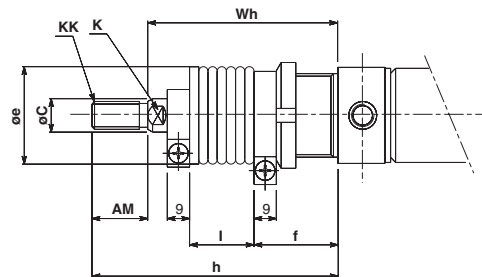
Rail mounting type (A)



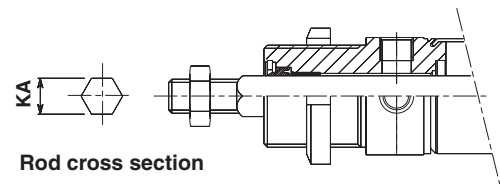
Band mounting type (B)
or non-magnet



With rod boot



C□76KE **Bore** **Stroke** C-□
Non-rotating, Piston rod (Rubber cushion only)



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | FB | G | H | HR | K | KA | KK | øKV | KW | N | NB | S | SW | TC | øTDH9 | TW | WH | XB | XC | ZZ |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|----|------|----|------|------------|-----|----|--------|------|----|----|---------|-----------------------------------|------|----|----|-----|-----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 14 | 9 | 58 | 23.8 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 17(19) | 34.5 | 68 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 | 97 | 140 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 16 | 12 | 69 | 28.3 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 22(25) | 42.5 | 89 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 | 122 | 174 |

() : In the case of air cushion

With Rod Boot

(mm)

| Bore | Stroke | AM | øC | øE | f | K | KK | h | | | | | | |
|------|--------|----|----|----|----|----|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | 20 | 12 | 35 | 30 | 10 | M10 x 1.5 | 77 | 90 | 102 | 115 | 140 | 165 | 190 |
| 40 | | 24 | 14 | 46 | 35 | 12 | M12 x 1.75 | 88 | 101 | 113 | 126 | 151 | 176 | 201 |

| Bore | Stroke | l | | | | | | | Wh | | | | | | |
|------|--------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 57 | 70 | 82 | 95 | 120 | 145 | 170 |
| 40 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 64 | 77 | 89 | 102 | 127 | 152 | 177 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

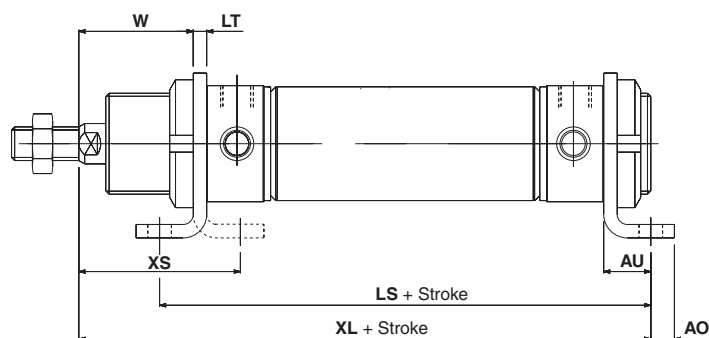
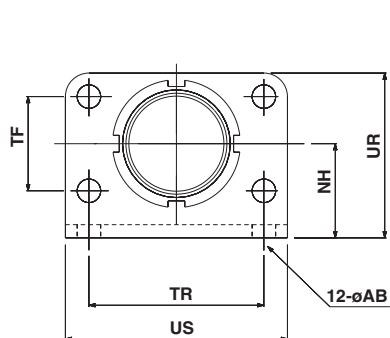
Series C76

Dimensions with Mounting Bracket

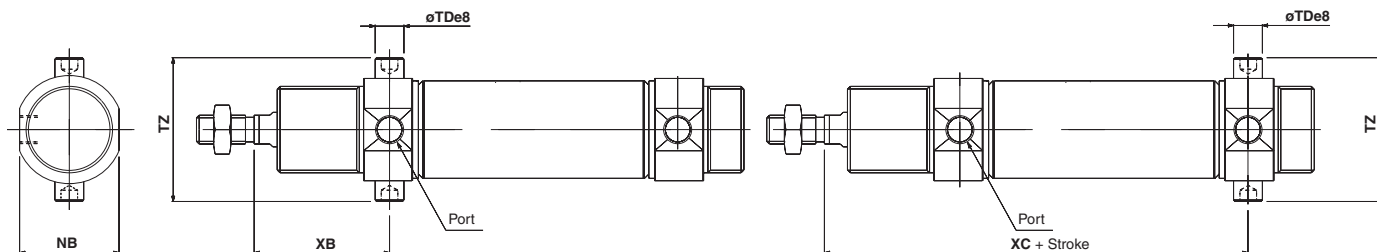
[First angle projection]

Double acting: Single rod

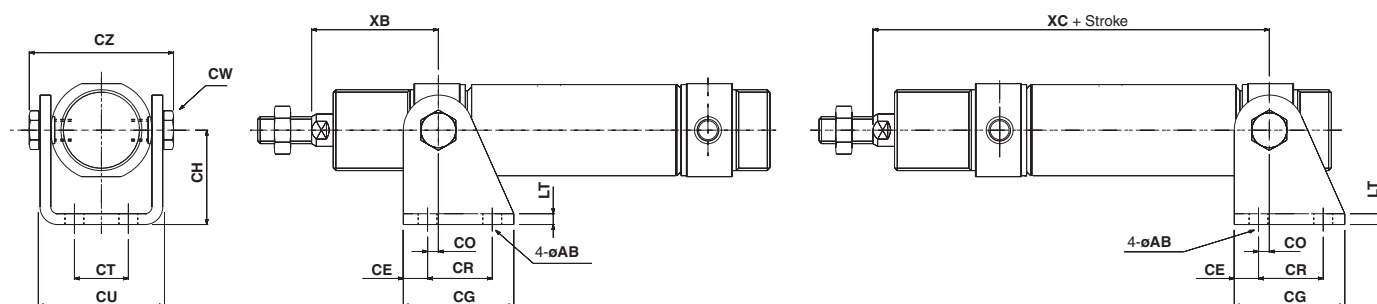
Rod foot (Flange), Rod and head foot: C76F32^A, C76F40^B



Rod trunnion, Head trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



(mm)

| Bore | Rod foot (Flange) | | | | | | | | | | | | | Rod/Head trunnion | | | | | Rod clevis, Head clevis | | | | | | | | | | | | |
|------|-------------------|----|----|-----|----|----|----|----|----|----|----|-----|----|-------------------|-----------------------------|------|----|-----|-------------------------|----|----|----|----|----|----|------|----|------|----|----|-----|
| | øAB | AO | AU | LS | LT | NH | TF | TR | UR | US | W | XL | XS | NB | øTDe8 | TZ | XB | XC | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB | XC |
| 32 | 7 | 7 | 14 | 96 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 120 | 48 | 34.5 | 10 ^{-0.025/-0.047} | 47.9 | 47 | 97 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 | 97 |
| 40 | 9 | 10 | 20 | 129 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 154 | 60 | 42.5 | 12 ^{-0.032/-0.059} | 59.3 | 57 | 122 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 | 122 |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

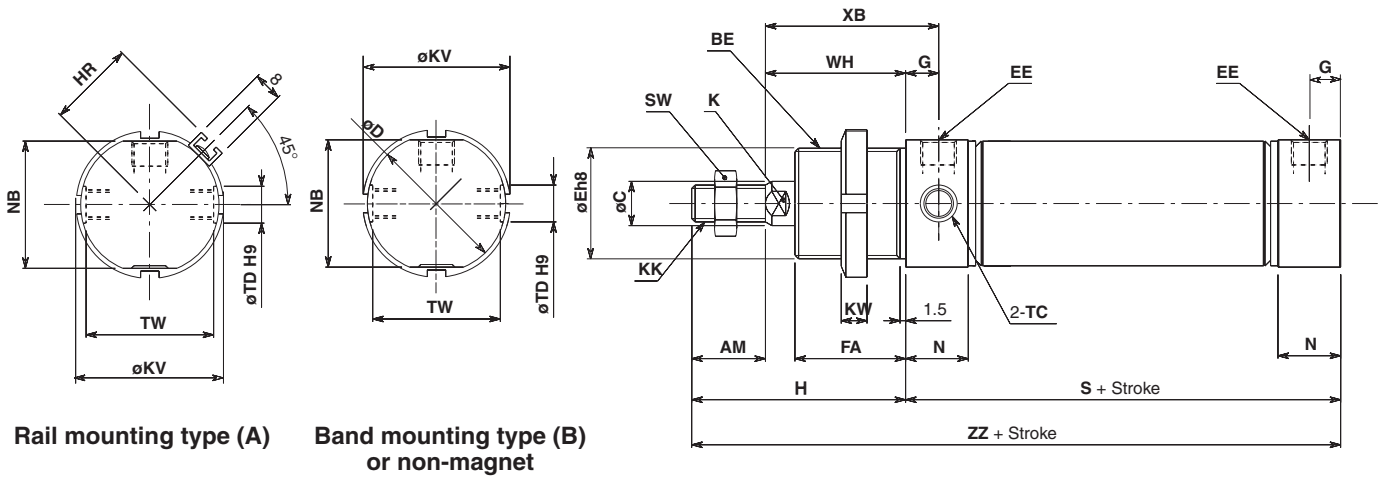
Dimensions

[First angle projection]

Double acting, Single rod

Rubber cushion: C□76E **Bore** **Stroke** □

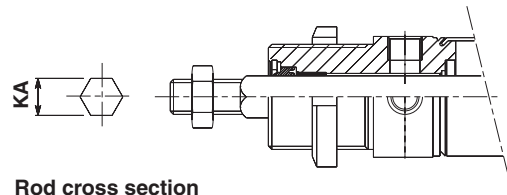
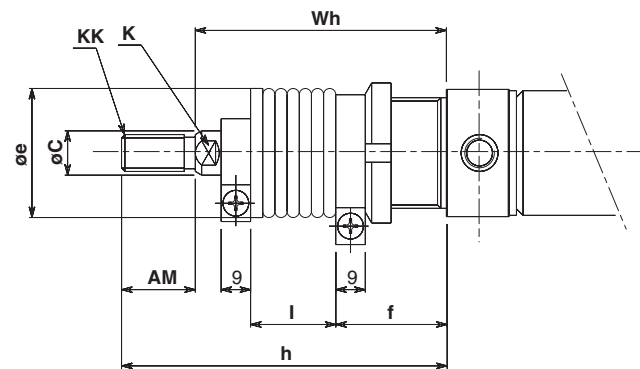
Without magnet, Built-in magnet



With rod boot

C□76KF

Non-rotating, Piston rod (Rubber cushion only)



(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | G | H | HR | K | KA | KK | øKV | KW | N | NB | S | SW | TC | øTDH9 | TW | WH | XB | ZZ |
|------|----|-----------|----|------|-------------------|-------|----|----|----|------|----|------|------------|-----|----|----|------|----|----|---------|-------------------|------|----|----|-----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | $30^{0}_{-0.033}$ | G 1/8 | 30 | 9 | 58 | 23.8 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 17 | 34.5 | 68 | 17 | M8 x 1 | $10^{+0.036}_{0}$ | 34.5 | 38 | 47 | 126 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | $38^{0}_{-0.039}$ | G 1/4 | 35 | 12 | 69 | 28.3 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 22 | 42.5 | 89 | 19 | M10 x 1 | $12^{+0.043}_{0}$ | 42.5 | 45 | 57 | 158 |

With Rod Boot

(mm)

| Bore | Item Stroke | AM | øC | øe | f | K | KK | h | | | | | | |
|------|----------------|----|----|----|----|----|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | 20 | 12 | 35 | 30 | 10 | M10 x 1.5 | 77 | 90 | 102 | 115 | 140 | 165 | 190 |
| 40 | | 24 | 14 | 46 | 35 | 12 | M12 x 1.75 | 88 | 101 | 113 | 126 | 151 | 176 | 201 |

| Bore | Item Stroke | I | | | | | | | Wh | | | | | | |
|------|----------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 57 | 70 | 82 | 95 | 120 | 145 | 170 |
| 40 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 64 | 77 | 89 | 102 | 127 | 152 | 177 |

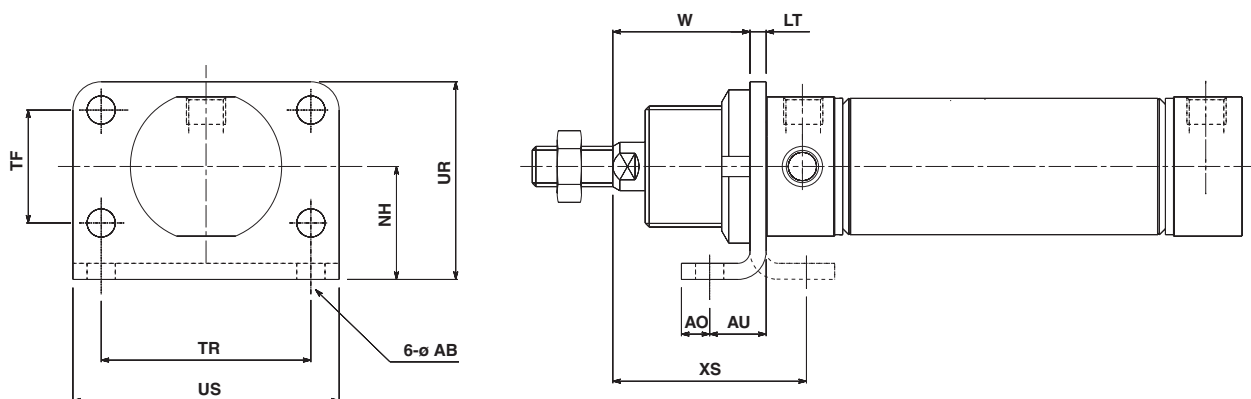
Series C76

Dimensions with Mounting Bracket

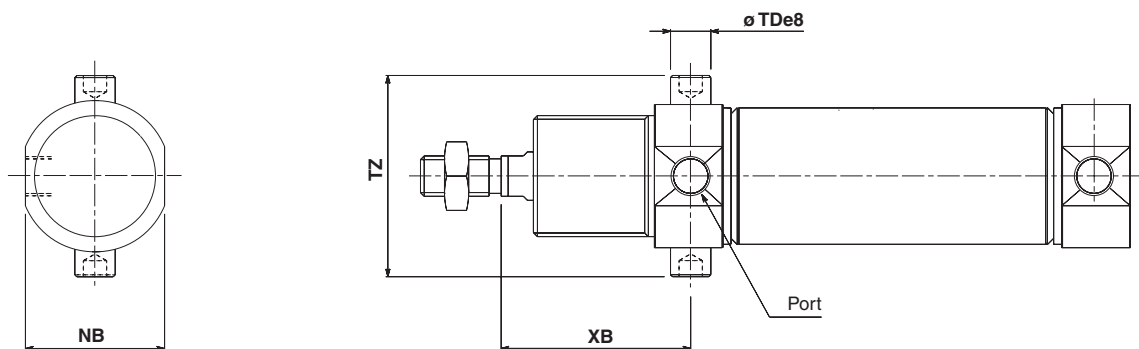
[First angle projection]

Double acting, Single rod

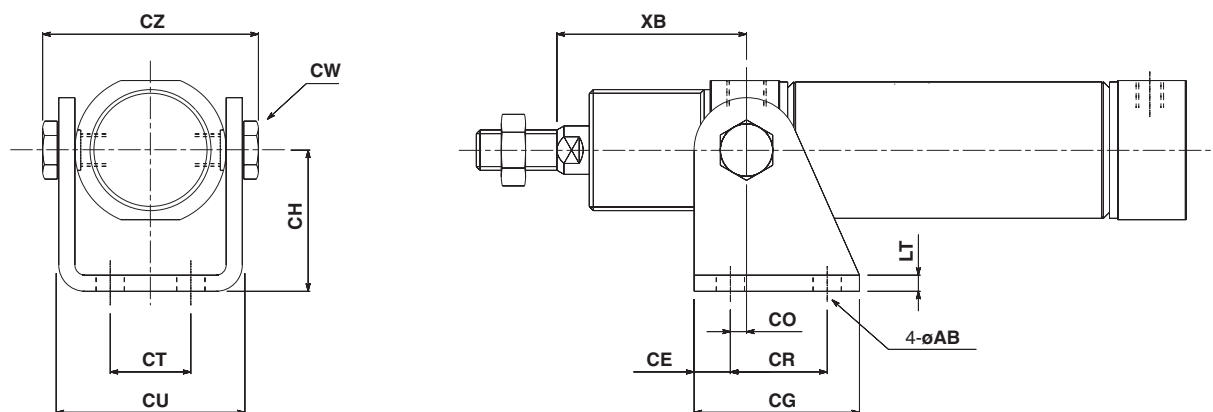
Rod foot (Flange): C76F32A, C76F40A



Rod trunnion: C76T32, C76T40



Rod clevis: C76C32, C76C40



(mm)

| Bore | Rod foot (Flange) | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | | |
|------|-------------------|----|----|----|----|----|----|----|----|----|----|--------------|--------------------------------|------|----|------------|----|----|----|----|----|----|------|----|------|----|----|
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | W | XS | NB | øTDe8 | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} -0.047 | 47.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} -0.059 | 59.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

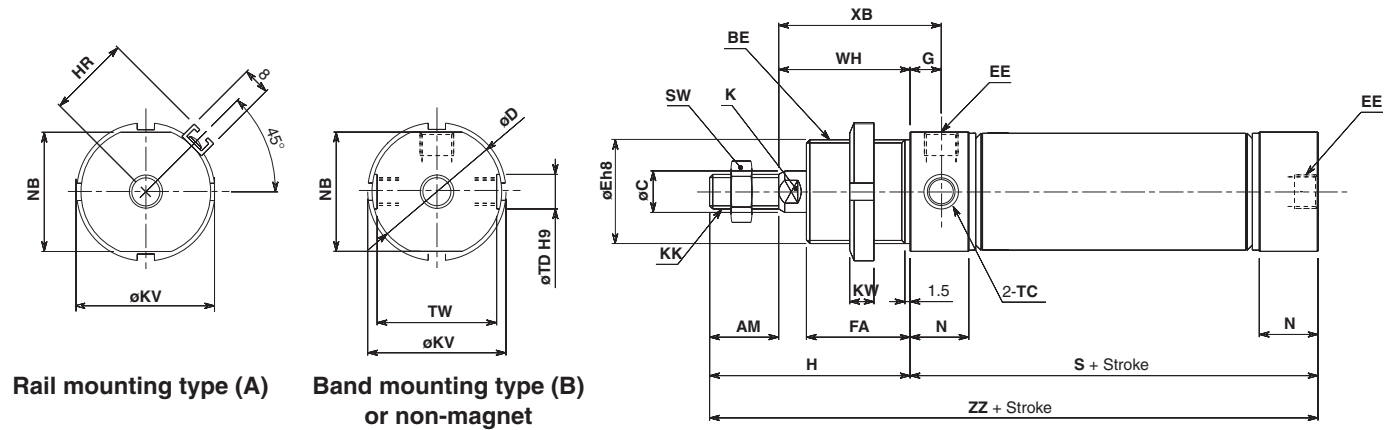
Dimensions

[First angle projection]

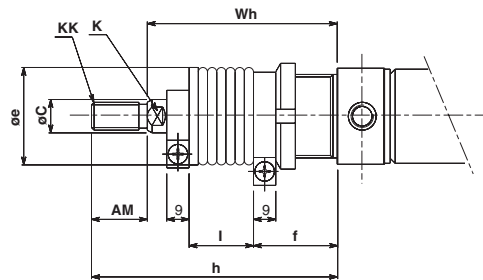
Double acting, Single rod

Rubber cushion: C□76Y **Bore** **Stroke** □

Without magnet, Built-in magnet

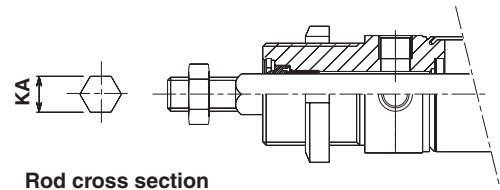


With rod boot



C□76KY

Non-rotating, Piston rod (Rubber cushion only)



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | G | H | HR | K | KA | KK | øKV/KW | N | NB | S | SW | TC | øTDH9 | TW | WH | XB | ZZ | |
|------|----|-----------|----|------|-------------------|-------|----|----|----|------|----|------|------------|--------|---|----|------|----|----|---------|-------------------|------|----|----|-----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | $30^{0}_{-0.033}$ | G 1/8 | 30 | 9 | 58 | 23.8 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 17 | 34.5 | 68 | 17 | M8 x 1 | $10^{+0.036}_{0}$ | 34.5 | 38 | 47 | 126 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | $38^{0}_{-0.039}$ | G 1/4 | 35 | 12 | 69 | 28.3 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 22 | 42.5 | 89 | 19 | M10 x 1 | $12^{+0.043}_{0}$ | 42.5 | 45 | 57 | 158 |

With Rod Boot

(mm)

| Bore | Stroke | Item | AM | øC | øe | f | K | KK | h | | | | | | |
|------|--------|------|----|----|----|----|----|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | | 20 | 12 | 35 | 30 | 10 | M10 x 1.5 | 77 | 90 | 102 | 115 | 140 | 165 | 190 |
| 40 | | | 24 | 14 | 46 | 35 | 12 | M12 x 1.75 | 88 | 101 | 113 | 126 | 151 | 176 | 201 |

| Bore | Stroke | Item | I | | | | | | | Wh | | | | | | |
|------|--------|------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 32 | | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 57 | 70 | 82 | 95 | 120 | 145 | 170 |
| 40 | | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 64 | 77 | 89 | 102 | 127 | 152 | 177 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

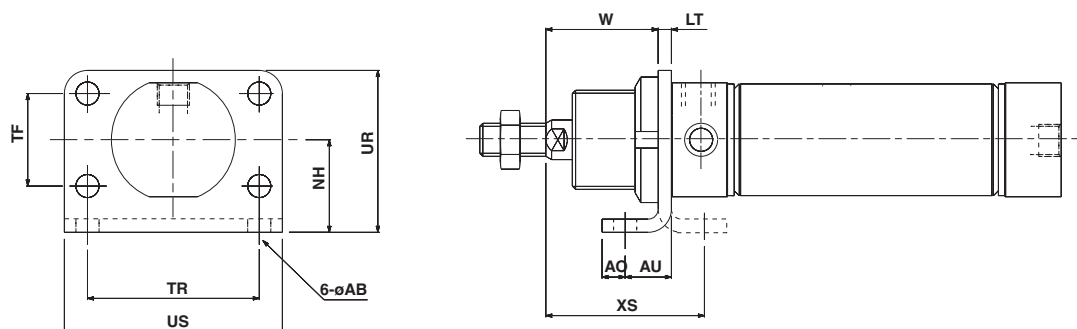
Series C76

Dimensions with Mounting Bracket

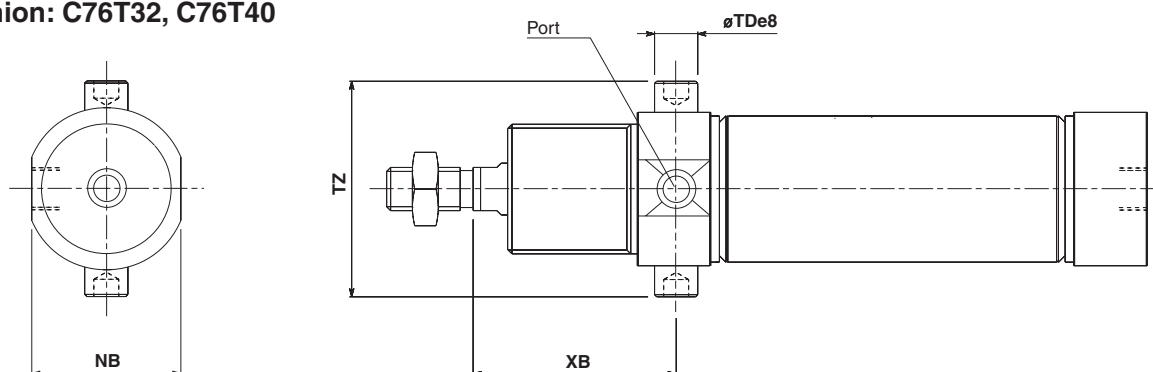
[First angle projection]

Double acting, Single rod

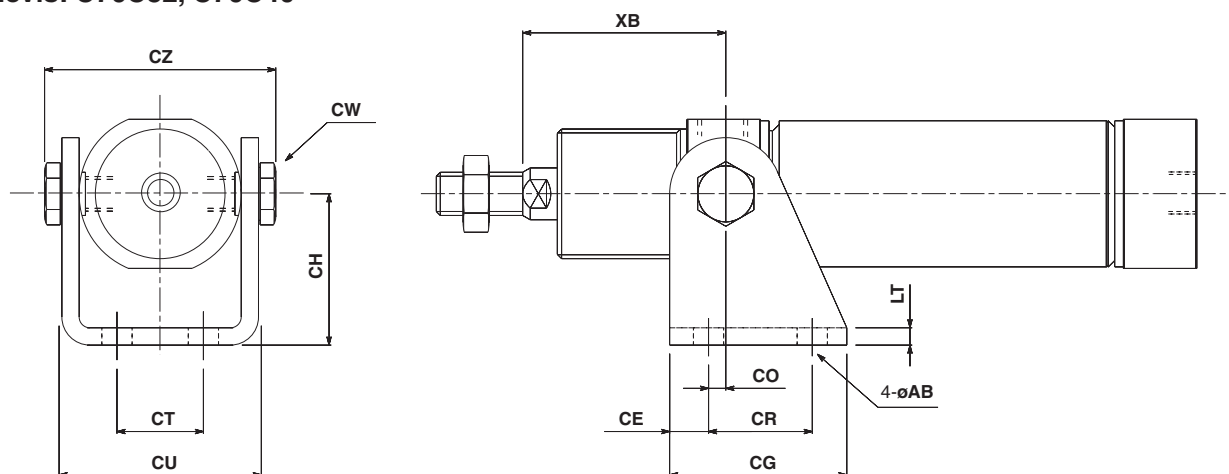
Rod foot (Flange): C76F32A, C76F40A



Rod trunnion: C76T32, C76T40



Rod clevis: C76C32, C76C40



(mm)

| Bore | Rod foot (Flange) | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | | |
|------|-------------------|----|----|----|----|----|----|----|----|----|----|--------------|--------------------------------|------|----|------------|----|----|----|----|----|----|------|----|------|----|----|
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | W | XS | NB | øTDe8 | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} -0.047 | 47.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} -0.047 | 59.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

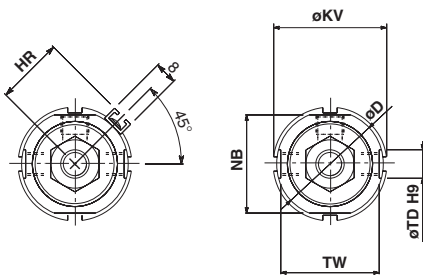
Dimensions

[First angle projection]

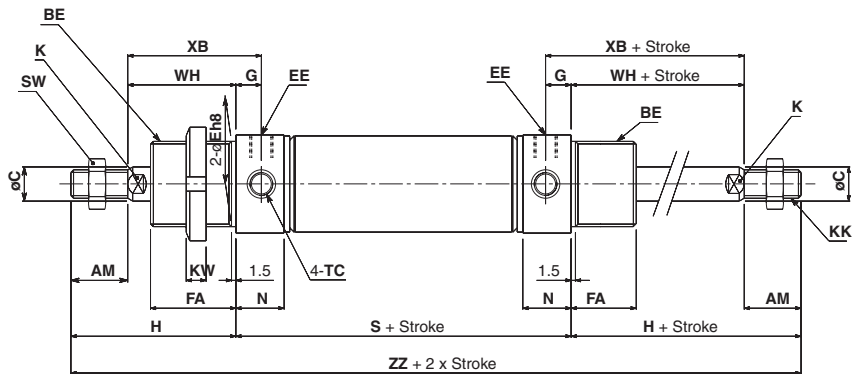
Double acting, Double rod

Rubber cushion: C□76WE Bore Stroke □

Without magnet, Built-in magnet

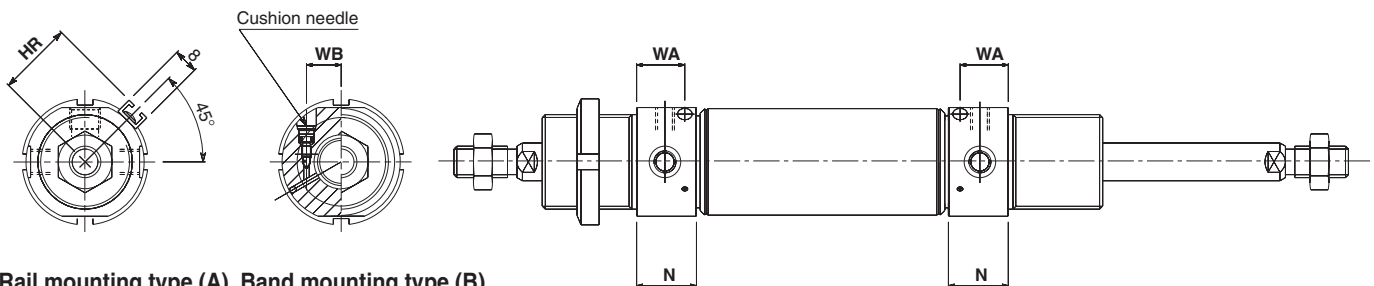


Rail mounting style (A) Band mounting style (B)
or non-magnet



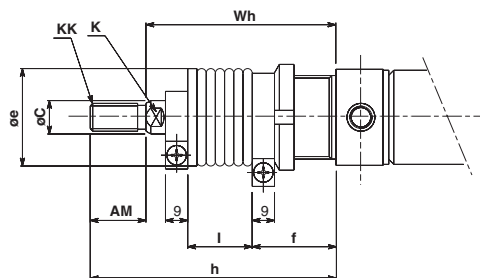
Air cushion: C□76WE Bore Stroke C-□

Built-in magnet



Rail mounting type (A) Band mounting type (B)
or non-magnet

With rod boot



(mm)

| Bore | AM | BE | φC | φD | φEh8 | EE | FA | G | H | HR | K | KK | φKV | WB | KW | N | NB | S | SW | TC | φTDH9 | TW | WH | XB | ZZ | WA |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|------|----|------------|-----|----|----|--------|------|----|----|---------|-----------------------------------|------|----|----|-----|------|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 9 | 58 | 23.8 | 10 | M10 x 1.5 | 38 | 11 | 7 | 17(19) | 34.5 | 68 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 | 184 | 15.3 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 12 | 69 | 28.3 | 12 | M12 x 1.75 | 50 | 13 | 8 | 22(25) | 42.5 | 89 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 | 227 | 20 |

() : In the case of air cushion

With rod boot

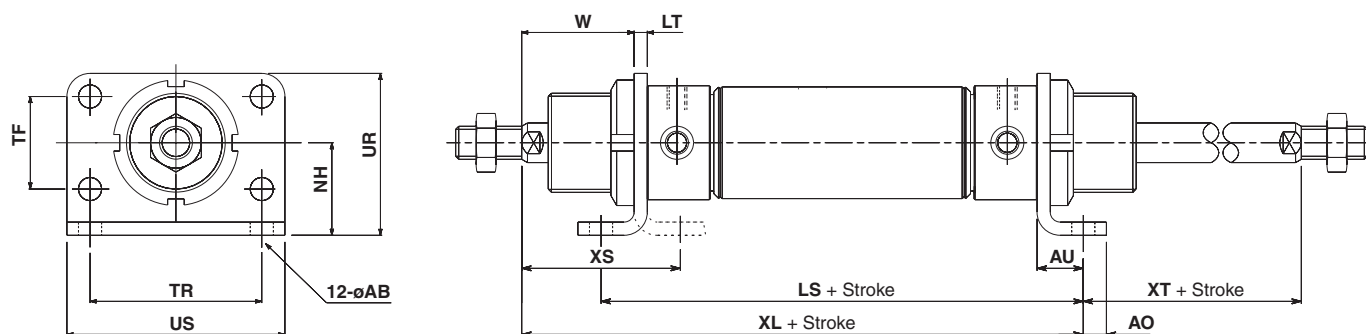
Series C76

Dimensions with Mounting Bracket

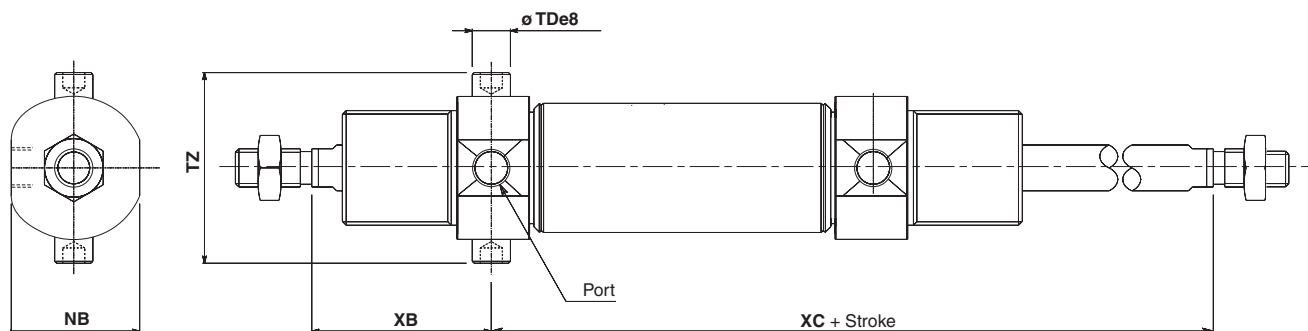
[First angle projection]

Double acting: Double rod

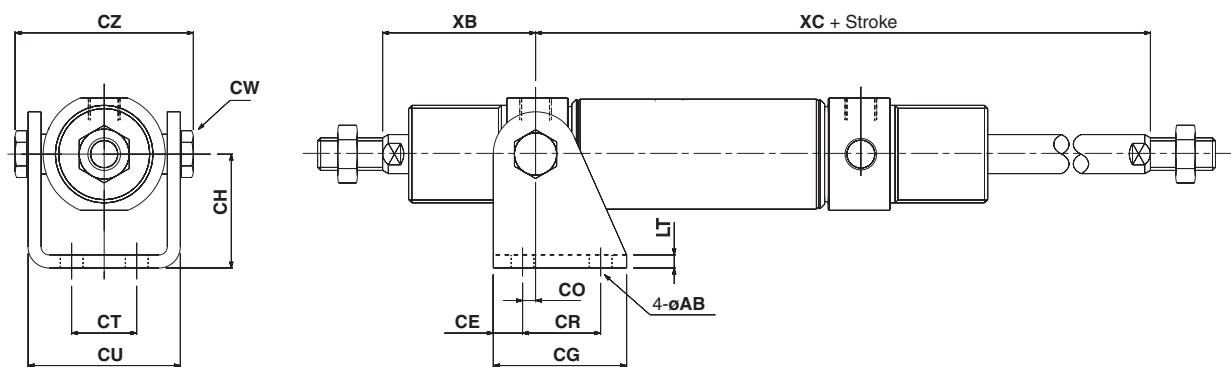
Rod foot (Flange), Rod and head foot: C76F32^A, C76F40^A



Rod trunnion, Head trunnion: C76T32, C76T40



Clevis: C76C32, C75C40



(mm)

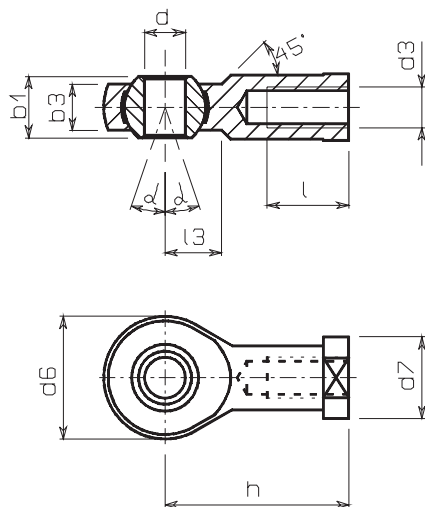
| Bore | Rod foot (Flange) | | | | | | | | | | | | | | Rod/Head trunnion | | | | Clevis | | | | | | | | | | | | | |
|------|-------------------|----|----|-----|----|----|----|----|----|----|----|-----|----|----|-------------------|--|------|----|--------|-----|----|----|----|----|----|----|------|----|------|----|----|-----|
| | øAB | AO | AU | LS | LT | NH | TF | TR | UR | US | W | XL | XS | XT | NB | øTDe8 | TZ | XB | XC | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB | XC |
| 32 | 7 | 7 | 14 | 96 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 120 | 48 | 24 | 34.5 | 10 ^{-0.025} _{-0.047} | 47.9 | 47 | 97 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 | 97 |
| 40 | 9 | 10 | 20 | 129 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 154 | 60 | 25 | 42.5 | 12 ^{-0.032} _{-0.059} | 59.3 | 57 | 122 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 | 122 |

Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C76**

Accessory Dimensions

[First angle projection]

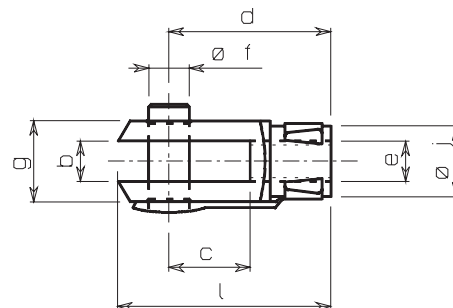
Single Knuckle Joint/DIN648



(mm)

| Bore | Model | Thread d3 | dH71 | h | d6 | b3 | b1 | l | d7 | α^0 | l3 |
|------|--------|------------|------|----|----|------|----|----|----|------------|----|
| 32 | KJ10DA | M10 x 1.5 | 10 | 43 | 20 | 10.5 | 14 | 20 | 19 | 13 | 14 |
| 40 | KJ12DA | M12 x 1.75 | 12 | 50 | 30 | 12 | 16 | 22 | 22 | 13 | 16 |

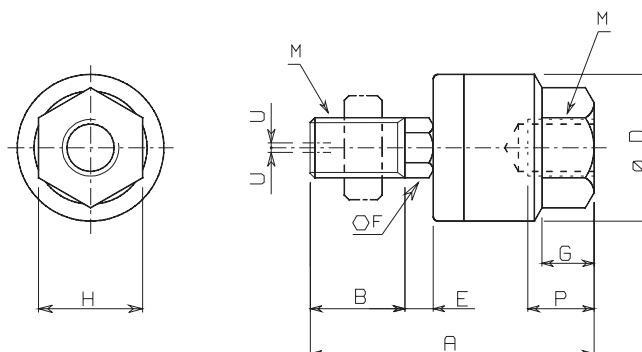
Double Knuckle Joint/DIN71751



(mm)

| Bore | Model | Thread e | b | d | f | g | c | j | a |
|------|-----------|------------|----|----|----|----|----|----|----|
| 32 | GKM10-20A | M10 x 1.5 | 10 | 40 | 10 | 18 | 20 | 12 | 20 |
| 40 | GKM12-24A | M12 x 1.75 | 12 | 48 | 12 | 23 | 24 | 15 | 24 |

Floating joint/Series JA JA25/40



(mm)

| Bore | Model | M | | A | B | D | E | F | G | H | Maximum screwed depth P | Allowable eccentricity U | Max. operating tension and compression power (kN) |
|------|-------------|------------------------|-------|------|------|----|---|----|----|----|-------------------------------|-----------------------------|--|
| | | Nominal thread dia. | Pitch | | | | | | | | | | |
| 32 | JA25-10-150 | 10 | 1.5 | 49.5 | 19.5 | 24 | 5 | 8 | 8 | 17 | 9 | 0.5 | 2.5 |
| 40 | JA40-12-175 | 12 | 1.75 | 60 | 20 | 31 | 6 | 11 | 11 | 22 | 13 | 0.75 | 4.4 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

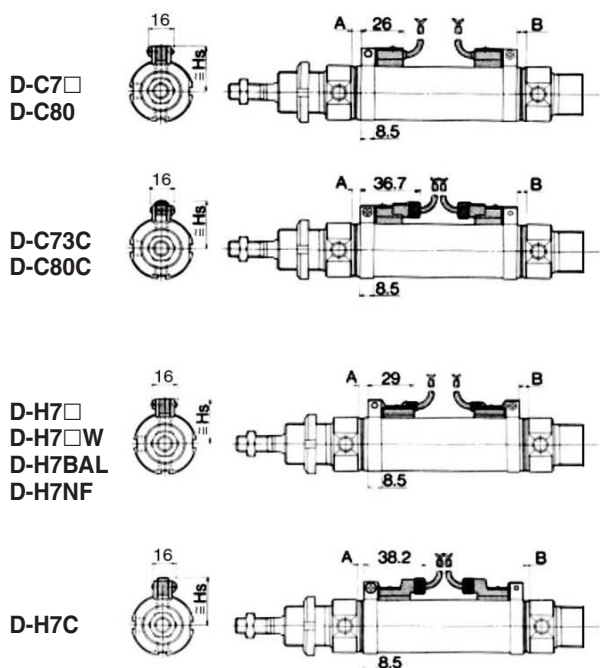
Data

Series C76

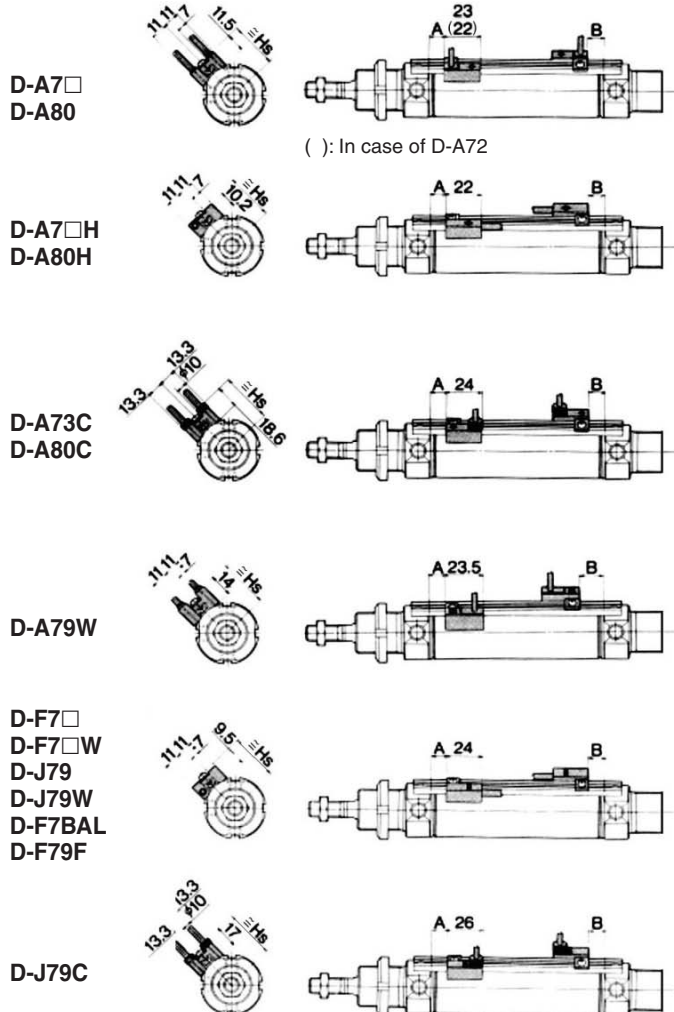
Auto Switch Mounting Position and Mounting Height

[First angle projection]

(Band mounting type)



(Rail Mounting type)



() : In case of D-A72

Auto Switch Mounting Position

(mm)

| Bore | D-C7□ D-C80 D-C73C D-C80C | | D-A73 D-A80 | | D-A7□H/A80H/A72 D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-J79C/F7BAL D-F79F | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | | D-A79W | |
|------|------------------------------------|--------|----------------|-------------|--|---------|---|--------|--------|--------|
| | A | B | A | B | A | B | A | B | A | B |
| 32 | 8 (6) | 7 (5) | 8.5 (6.5) | 14.5 (11.5) | 9 (7) | 8 (6) | 7 (5) | 6 (4) | 6 (5) | 12 (9) |
| 40 | 10 (11) | 12 (9) | 7.5 (5.5) | 12.5 (9.5) | 15 (12) | 13 (10) | 13 (10) | 11 (8) | 5 (3) | 11 (7) |

- () For air cushion type
- Aim at this number

Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H D-A80H | D-F7□/J79 D-F7□W D-J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C |
|------|---|------------------|----------------|------------------|--|------------------|-------|--------|--------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 32 | 28.5 | 31 | 30.5 | 28 | 30 | 36 | 31.5 | 31.5 | 34.5 |
| 40 | 32.5 | 35 | 35 | 5 | 34.5 | 40.5 | 35.5 | 36 | 39 |

- Aim at this number

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended

Series C76

ø32, ø40

How to Order

Single acting,
Spring return/
Spring extended

C D 76 K E 32 100 S B R2

Built-in magnet

| | |
|-----|-----------------|
| Nil | None |
| D | Built-in magnet |

Type

| | |
|-----|---|
| Nil | Standard |
| K | Non-rotating rod (Rubber cushion only) |

Mounting style

| Symbol | Mounting |
|--------|-------------------------|
| E | Double end |
| F | Front nose |
| Y | Front nose in line port |

Auto switch mounting type

| | |
|---|---------------|
| A | Rail mounting |
| B | Band mounting |

Applicable auto switches and bands are shown on pages 6-10-43 to 6-10-44. Please order auto switches and bands separately

Action

| | |
|---|--------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extended |

Option

| | |
|----|--|
| R | Stainless steel piston rod, rod end nut and mounting nut |
| R2 | Stainless steel piston rod and rod end nut |

Bore size Stroke

| Bore size (mm) | Standard stroke (mm) | Max. stroke (mm) |
|----------------|--------------------------|------------------|
| 32 | 10, 25, 40, 50, 80, 100, | 200 |
| 40 | 125, 160, 200, 250* | 250 |

* Except Bore 32

Example of How to Order

- Cylinder without auto switch, Bore size: 32, Stroke: 100, Single acting/Spring return and Double end type.
C76E32-100S 1 pc. Cylinder
- Cylinder with auto switch (Band mounted type, 2 pcs.), Bore size: 40, Stroke: 100, Single acting/Spring return, Front nose in line port type and Flange mounting.
CD76Y40-100S-B 1 pc. Cylinder
C76F40A 1 pc. Flange mounting
D-C73L 2 pcs. Auto switch
BM2-040 2 pcs. For auto switch mounting band
- Cylinder with auto switch (Rail mounted type, 2 pcs.), Bore size: 40, Stroke: 50, Single acting/Spring return, Front nose type and Trunnion mounting.
CD76F40-50S-A 1 pc. Cylinder
C76T40 1 pc. Trunnion mounting
D-A73L 2 pcs. Auto switch
- Non-rotating: Cylinder without auto switch, Bore size: 32, Stroke: 100, Single acting/Spring return and Double end type.
C76KE32-100S 1 pc. Cylinder

Mounting Bracket Part No.

| Bore size (mm) | | 32 | 40 |
|------------------|---|-------------|-------------|
| Mounting bracket | Flange, Foot (1 pc.) | C76F32A | C76F40A |
| | Flange, Foot (2 pcs. with mounting nut 1 pc.) | C76F32B | C76F40B |
| | Trunnion | C76T32 | C76T40 |
| | Clevis | C76C32 | C76C40 |
| Accessory | Single knuckle joint | KJ10DA | KJ12DA |
| | Double knuckle joint | GKM10-20A | GKM12-24A |
| | Floating joint | JA25-10-150 | JA40-12-175 |

Replacement Parts

| Bore (mm) | Part no. | | Note |
|-----------|----------|--------------|---|
| | Standard | Non-rotating | |
| 32 | C76-32PS | C76K-32PS | Every set includes: 1 rod seal |
| 40 | C76-40PS | C76K-40PS | 1 seal retaining washer 1 retaining ring |

Suitable also C76 series

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

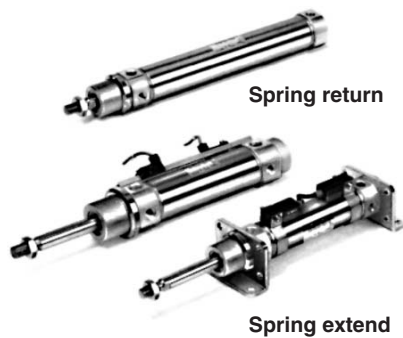
D-

-X

20-

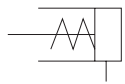
Data

Series C76

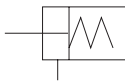


JIS Symbol

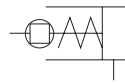
Standard
Spring return



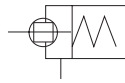
Spring extended



Non-rotating
Spring return



Spring extended



Specifications

| Bore size (mm) | 32 | 40 |
|-------------------------------|--|------------|
| Piston rod dia. (mm) | 12 | 14 |
| Piston rod thread | M10 x 1.5 | M12 x 1.75 |
| Port size | G 1/8 | G 1/4 |
| Action | Single acting, Single rod, Spring return/extend | |
| Fluid | Air | |
| Proof pressure | 1.5 MPa | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | Spring return: 0.18 MPa, Spring extended: 0.23 MPa | |
| Ambient and fluid temperature | -20 to 80°C (Built-in magnet type: -10 to 60°C) | |
| Lubrication | Not required. Use turbine oil Class 1 ISO VG32, if lubricated. | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | 0.65 J | 1.2 J |
| Non-rotating accuracy | ±0.5° | ±0.5° |
| Stroke tolerance (mm) | 0/+1.4 | |

Spring Force (Standard, Non-rotating)

Spring Return

(N)

| Bore size (mm) | Standard stroke | Spring force | | | | | | | | | | | | | |
|----------------|-----------------|--------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|
| | | 10 | | 25 | | 50 | | 100 | | 150 | | 200 | | 250 | |
| | | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract |
| 32 | 10, 25 | | | | | | | | | | | | | | |
| | 50, 100 | 53.9 | 48.8 | 53.9 | 41.2 | 53.9 | 28.4 | 66.7 | 19.6 | 66.7 | 18.1 | 66.7 | 19.6 | — | — |
| | 150, 200 | | | | | | | | | | | | | | |
| 40 | 10, 25 | | | | | | | | | | | | | | |
| | 50, 100 | 78.5 | 72.6 | 78.5 | 63.7 | 78.5 | 49.0 | 76.5 | 23.5 | 76.5 | 23.5 | 76.5 | 23.5 | 76.5 | 23.5 |
| | 150, 200 | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | |

Spring Extended

(N)

| Bore size (mm) | Standard stroke | Spring force | | | | | | | | | | | | | |
|----------------|-----------------|--------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|
| | | 10 | | 25 | | 50 | | 100 | | 150 | | 200 | | 250 | |
| | | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract |
| 32 | 10, 25 | | | | | | | | | | | | | | |
| | 50, 100 | 66.7 | 56.3 | 66.7 | 40.7 | 66.7 | 14.7 | 66.7 | 19.6 | 66.7 | 18.1 | 66.7 | 19.6 | — | — |
| | 150, 200 | | | | | | | | | | | | | | |
| 40 | 10, 25 | | | | | | | | | | | | | | |
| | 50, 100 | 76.5 | 65.9 | 76.5 | 50 | 76.5 | 23.5 | 76.5 | 23.5 | 76.5 | 23.5 | 76.5 | 23.5 | 76.5 | 23.5 |
| | 150, 200 | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | |

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

Weight

Spring Return

(g)

| Bore size (mm) | | | 32 | 40 |
|------------------|----------------------|---------|------|------|
| Basic weight | 10 stroke | | 365 | 700 |
| | 25 stroke | | 390 | 735 |
| | 50 stroke | | 430 | 805 |
| | 100 stroke | | 685 | 1185 |
| | 150 stroke | | 860 | 1450 |
| | 200 stroke | | 1025 | 1705 |
| | 250 stroke | | — | 1960 |
| Mounting bracket | C76F□A | | 110 | 200 |
| | C76F□B | | 240 | 455 |
| | C76T□ | | 15 | 25 |
| | C76C□ | | 165 | 305 |
| Accessory | Single knuckle joint | KJ□D | 70 | 105 |
| | Double knuckle joint | GKM□-□A | 100 | 165 |
| | Floating joint | JA□-□-□ | 70 | 160 |

Calculation: (Example) C76E32-50S, C76T32
 Base weight 430 (ø32) g
 Mounting bracket..... 15 g
 430 + 15 = 445 g

Spring Extended

(g)

| Bore size (mm) | | | 32 | 40 |
|------------------|----------------------|---------|-----|------|
| Basic weight | 10 stroke | | 430 | 795 |
| | 25 stroke | | 455 | 835 |
| | 50 stroke | | 495 | 900 |
| | 100 stroke | | 640 | 1125 |
| | 150 stroke | | 795 | 1360 |
| | 200 stroke | | 940 | 1585 |
| | 250 stroke | | — | 1720 |
| Mounting bracket | C76F□A | | 110 | 200 |
| | C76F□B | | 240 | 455 |
| | C76T□ | | 15 | 25 |
| | C76C□ | | 165 | 305 |
| Accessory | Single knuckle joint | KJ□DA | 70 | 105 |
| | Double knuckle joint | GKM□-□A | 100 | 165 |
| | Floating joint | JA□-□-□ | 70 | 160 |

Calculation: (Example) C76F40-100T, C76C40, KJ12DA
 Base weight 11250 (ø40) g
 Mounting bracket 305 g
 Single knuckle joint 105 g
 1125 + 305 + 105 = 1535 g

Auto Switch Mounting, Minimum Possible Cylinder Stroke

Band Mounting Type

(mm)

| Auto switch model | No. of auto switches | | | | |
|--------------------------------------|----------------------|-----------|--|----------------|-------|
| | 2 pcs. | | n pcs. | | 1 pc. |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $50 + 45(n-2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $65 + 50(n-2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $60 + 45(n-2)$ | 10 |

Rail Mounting Type

(mm)

| Auto switch model | No. of auto switches | | | | |
|---|----------------------|-----------|-----------------|--|-------|
| | 2 pcs. | | n pcs. | | 1 pc. |
| | Different sides | Same side | Different sides | Same side | |
| D-A7□/A80 D-A7□H/A80H D-A73C/A80C D-F7□/F7□V D-J79/J79C | — | 10 | — | $10 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 5 |
| D-A79W, D-J79W D-F7□W, D-F7BAL D-F79F, F7□WV D-F7BAVL | — | 15 | — | $15 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C76

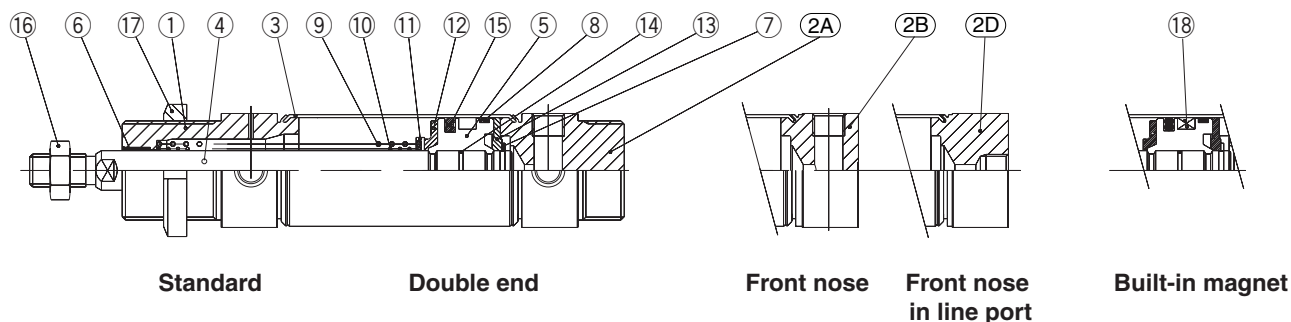
Construction

[First angle projection]

Single acting, Single rod

C□76□32/40-50S Spring return

50 mm stroke or less

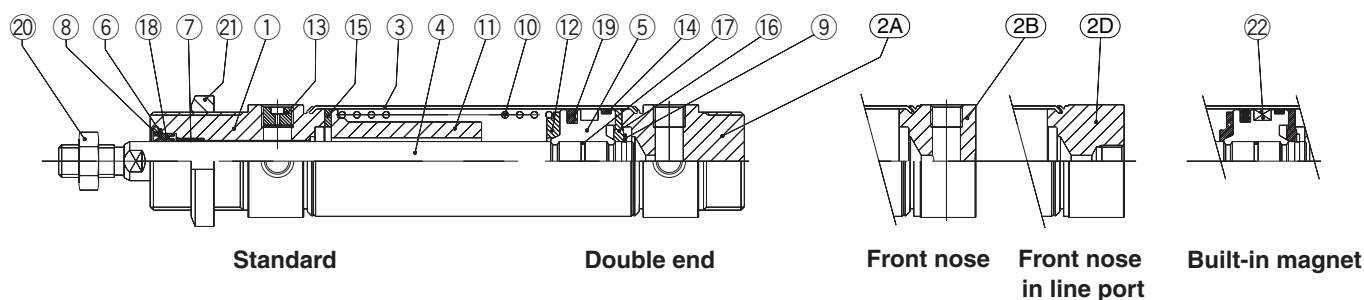


Component Parts

| No. | Description | Material | Qty. | Note |
|------|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| (2A) | Head cover E | Aluminum alloy | 1 | White anodized |
| (2B) | Head cover F | Aluminum alloy | 1 | White anodized |
| (2D) | Head cover Y | Aluminum alloy | 1 | Clear anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Bush | Sintered bronze | 1 | |
| ⑦ | Retaining ring | Stainless steel | 1 | |
| ⑧ | Wear ring | Resin | 2 | |

| No. | Description | Material | Qty. | Note |
|-----|-----------------|--------------|------|--------------------|
| ⑨ | Return spring A | Steel wire | 1 | Zinc chromate |
| ⑩ | Return spring B | Steel wire | 1 | Zinc chromate |
| ⑪ | Spring holder | Carbon steel | 1 | Zinc chromate |
| ⑫ | Bumper A | Urethane | 1 | |
| ⑬ | Bumper B | Urethane | 1 | |
| ⑭ | Piston gasket | NBR | 1 | |
| ⑮ | Piston seal | NBR | 1 | |
| ⑯ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑰ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑱ | Magnet | Magnet | 1 | (Switch type only) |

C□76□32/40-S Spring return
Over 50 mm stroke



Component Parts

| No. | Description | Material | Qty. | Note |
|------|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| (2A) | Head cover E | Aluminum alloy | 1 | White anodized |
| (2B) | Head cover F | Aluminum alloy | 1 | White anodized |
| (2D) | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑨ | Retaining ring | Stainless steel | 1 | |
| ⑩ | Return spring | Steel wire | 1 | Zinc chromate |
| ⑪ | Spring guide | Aluminum alloy | 1 | Chromate |
| ⑫ | Spring holder | Aluminum alloy | 1 | Chromate |

| No. | Description | Material | Qty. | Note |
|-----|------------------|--------------|------|--------------------|
| ⑬ | Plug with needle | Carbon steel | 1 | |
| ⑭ | Wear ring | Resin | 1 | |
| ⑮ | Bumper A | Urethane | 1 | |
| ⑯ | Bumper B | Urethane | 1 | |
| ⑰ | Piston gasket | NBR | 1 | |
| ⑱ | Rod seal | NBR | 1 | |
| ⑲ | Piston seal | NBR | 1 | |
| ⑳ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ㉒ | Magnet | Magnet | 1 | (Switch type only) |

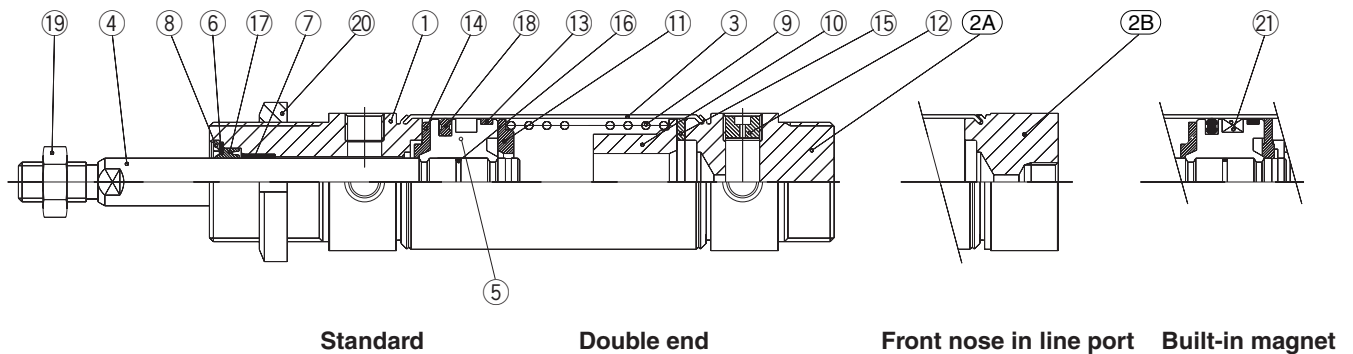
Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

Construction

[First angle projection]

Single acting, Single rod

C□76□32/40-T Spring extended



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|------------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover E | Aluminum alloy | 1 | White anodized |
| ②B | Head cover F | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑨ | Return spring | Steel wire | 1 | Zinc chromate |
| ⑩ | Spring guide | Aluminum alloy | 1 | Chromate |
| ⑪ | Spring holder | Aluminum alloy | 1 | Chromate |
| ⑫ | Plug with needle | Carbon steel | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------|--------------|------|--------------------|
| ⑬ | Wear ring | Resin | 1 | |
| ⑭ | Bumper A | Urethane | 1 | |
| ⑮ | Bumper B | Urethane | 1 | |
| ⑯ | Piston gasket | NBR | 1 | |
| ⑰ | Rod seal | NBR | 1 | |
| ⑱ | Piston seal | NBR | 1 | |
| ⑲ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑳ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Magnet | Magnet | 1 | (Switch type only) |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

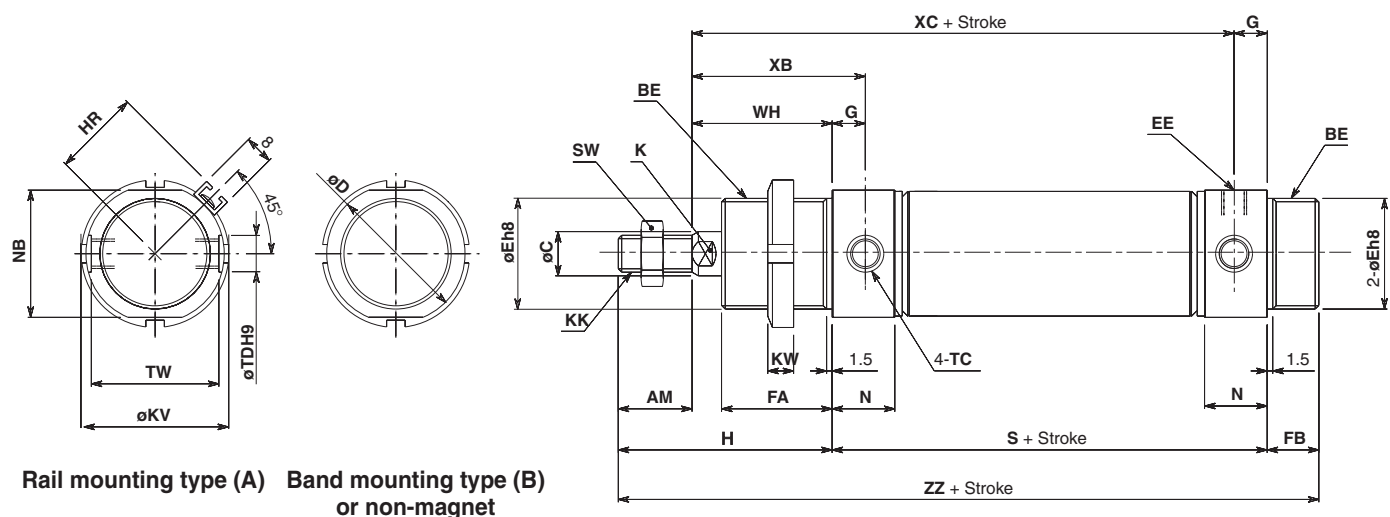
Data

Series C76

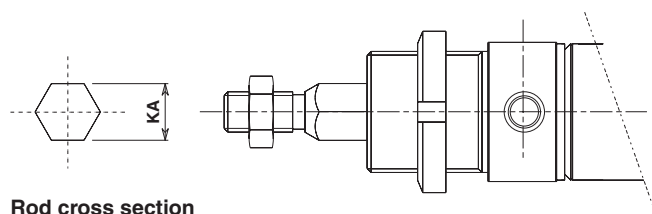
Dimensions

[First angle projection]

Single Acting/Spring return, Single rod
 Rubber cushion: C□76E Bore—Stroke S—□
 Without magnet, Built-in magnet



C□76KE
 Non-rotating, Piston rod



(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | FB | G | H | HR | K | KA | KK | øKV | KW | N | NB | SW | TC | øTDH9 | TW | WH | XB |
|------|----|-----------|----|------|--|------|----|----|----|----|------|----|------|------------|-----|----|----|------|----|---------|-----------------------------------|------|----|----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ^{+0.033} _{-0.033} | G1/8 | 30 | 14 | 9 | 58 | 23.8 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 17 | 34.5 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ^{+0.043} _{-0.039} | G1/8 | 35 | 16 | 12 | 69 | 28.3 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 22 | 42.5 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 |

| Item | | S | | | | | XC | | | | | ZZ | | | | |
|------|--------|----------|-----------|------------|------------|------------|-----------|-----------|------------|------------|------------|-----------|-----------|------------|------------|------------|
| Bore | Stroke | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | 68 (93) | 118 | 143 | 168 | — | 97 (122) | 147 | 172 | 197 | — | 140 (165) | 190 | 215 | 240 | — |
| 40 | | 89 (114) | 139 | 164 | 189 | 214 | 122 (147) | 172 | 197 | 222 | 247 | 174 (199) | 224 | 249 | 274 | 299 |

() : In the case of non-rotating

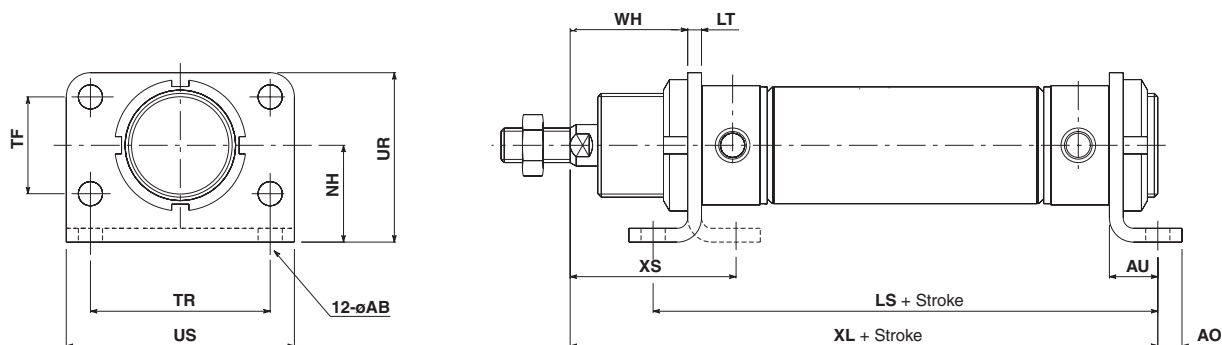
Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

Dimensions with Mounting Bracket

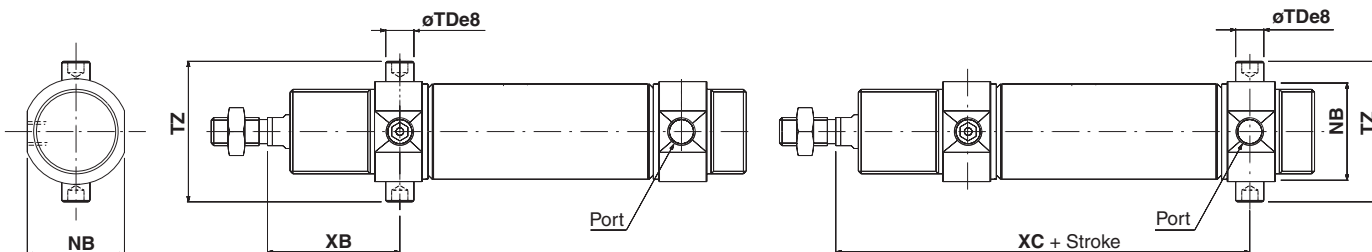
[First angle projection]

Single acting/Spring return, Single rod

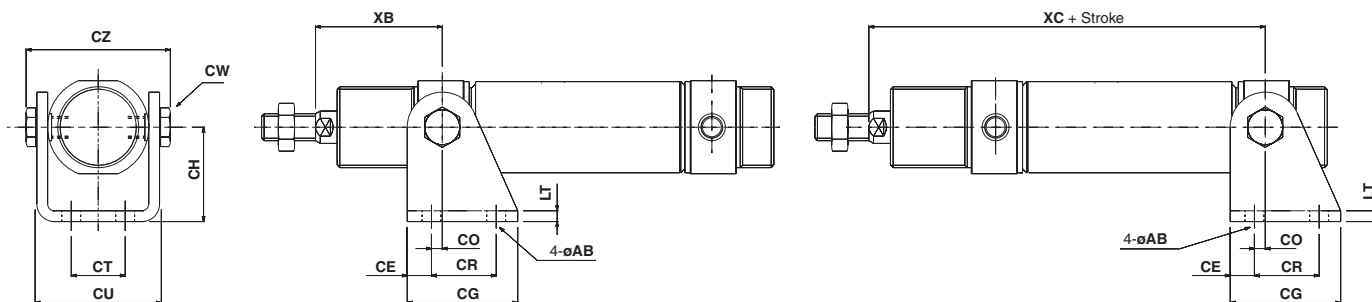
Rod foot (Flange), Rod and head foot: C76F32^A, C76F40^A



Rod trunnion, Head trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



| (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-------------------|----|----|----|----|----|----|----|----|----|----|------|--|------|----|-----|------------|----|----|----|----|----|------|----|------|----|----|
| Bore | Rod foot (Flange) | | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | |
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | W | XS | NB | øTDe8 | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} _{-0.047} | 49.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} _{-0.059} | 62.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 |

| Bore | Item Stroke | Rod foot (Flange), Rod and head foot | | | | | | | | | | Head side trunnion | | | | | Head clevis | | | | |
|------|----------------|--------------------------------------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|--------------------|-----------|------------|------------|------------|-------------|-----------|------------|------------|------------|
| | | LS | | | | | XL | | | | | XC | | | | | XC | | | | |
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | 96 | 146 | 171 | 196 | — | 120 | 170 | 195 | 220 | — | 97 | 147 | 172 | 197 | — | 97 | 147 | 172 | 197 | — |
| 40 | | 129 | 179 | 204 | 229 | 254 | 154 | 204 | 229 | 254 | 279 | 122 | 172 | 197 | 222 | 247 | 122 | 172 | 197 | 222 | 247 |

| |
|------------|
| CJ1 |
| CJP |
| CJ2 |
| CM2 |
| CG1 |
| MB |
| MB1 |
| CA2 |
| CS1 |
| C76 |
| C85 |
| C95 |
| CP95 |
| NCM |
| NCA |
| D- |
| -X |
| 20- |
| Data |

Series C76

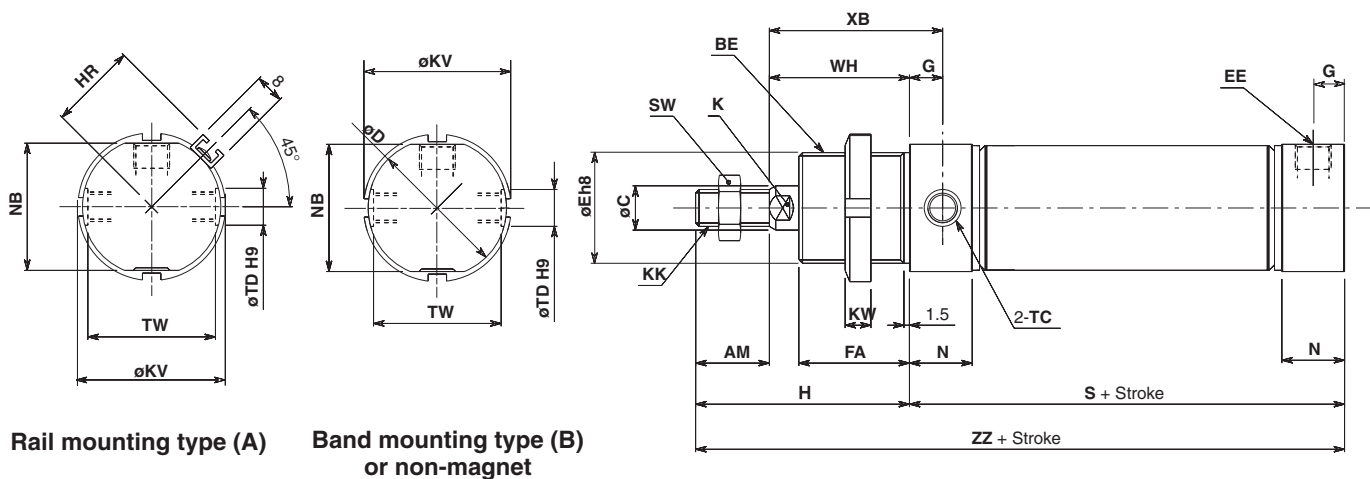
Dimensions

[First angle projection]

Single acting/Spring return, Single rod

Rubber cushion: C□76F Bore — Stroke S — □

Without Magnet, Built-in Magnet

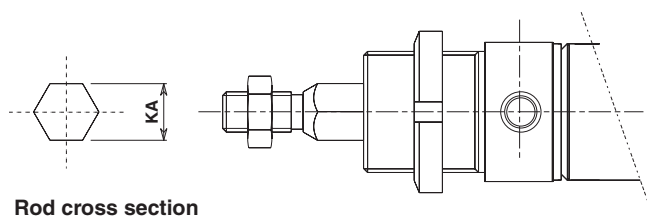


Rail mounting type (A)

Band mounting type (B)
or non-magnet

C□76KF

Non-rotating, Piston rod



Rod cross section

| Bore | AM | BE | oC | oD | oEh8 | EE | FA | G | H | K | KA | KK | oKV | KW | HR | N | NB | SW | TC | oTDH9 | TW | WH | XB |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|----|------|------------|-----|----|------|----|------|----|---------|-----------------------------------|------|----|----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 9 | 58 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 23.8 | 17 | 34.5 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 12 | 69 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 28.3 | 22 | 42.5 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 |

| Bore | Item | | S | | | | | ZZ | | | | |
|------|--------|--|----------|-----------|------------|------------|------------|-----------|-----------|------------|------------|------------|
| | Stroke | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | | 68 (93) | 118 | 143 | 168 | — | 126 (151) | 176 | 201 | 226 | — |
| 40 | | | 89 (114) | 139 | 164 | 189 | 214 | 158 (183) | 208 | 233 | 258 | 283 |

(): In the case of non-rotating

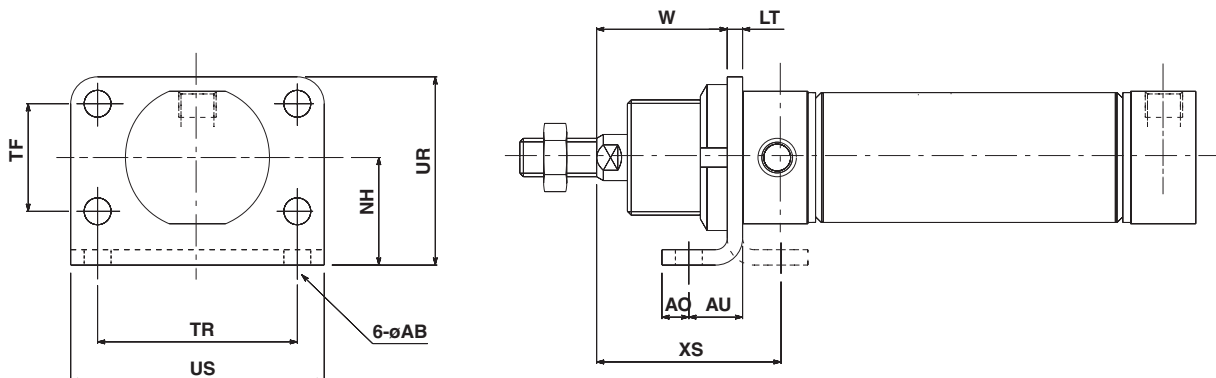
Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

Dimensions with Mounting Bracket

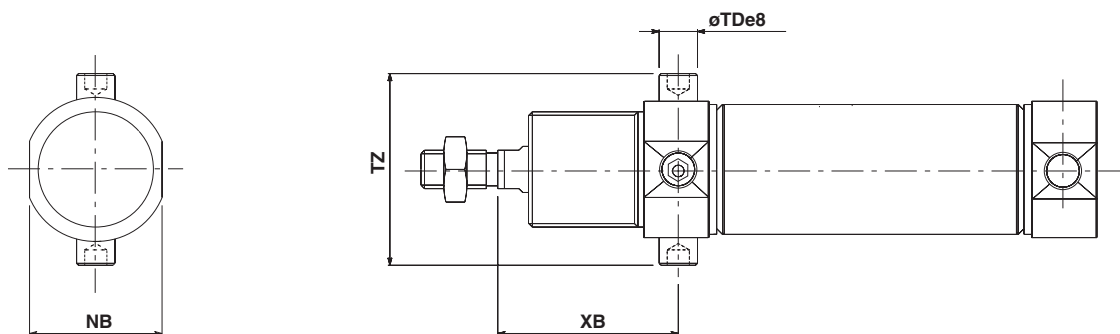
[First angle projection]

Single acting/Spring return, Single rod

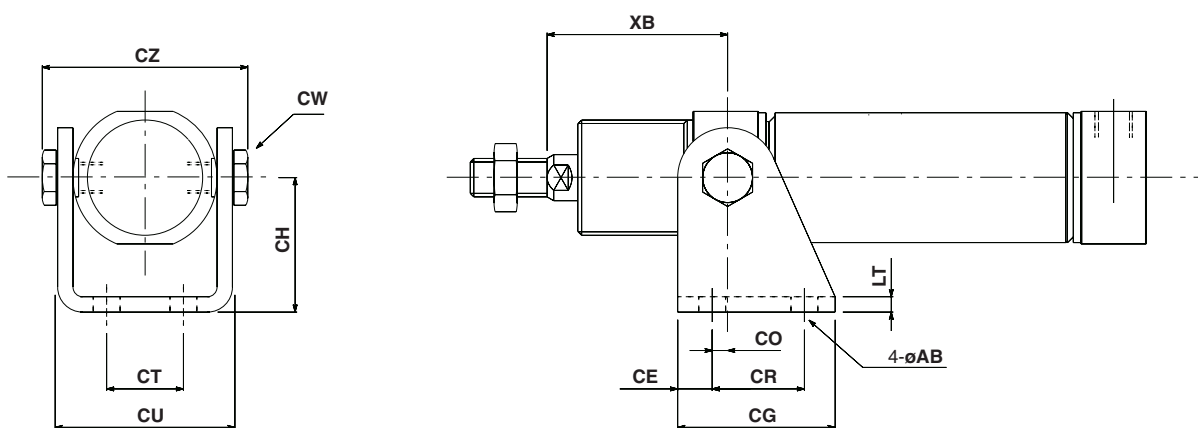
Rod foot (Flange), Rod and head foot: C76F32^A_B, C76F40^A_B



Rod trunnion, Head trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



| (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-------------------|----|----|----|----|----|----|----|----|----|----|------|--|------|----|-----|------------|----|----|----|----|----|------|----|------|----|----|
| Bore | Rod foot (Flange) | | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | |
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | W | XS | NB | øTDe8 | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} _{-0.047} | 49.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} _{-0.058} | 62.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 |

(mm)

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C76

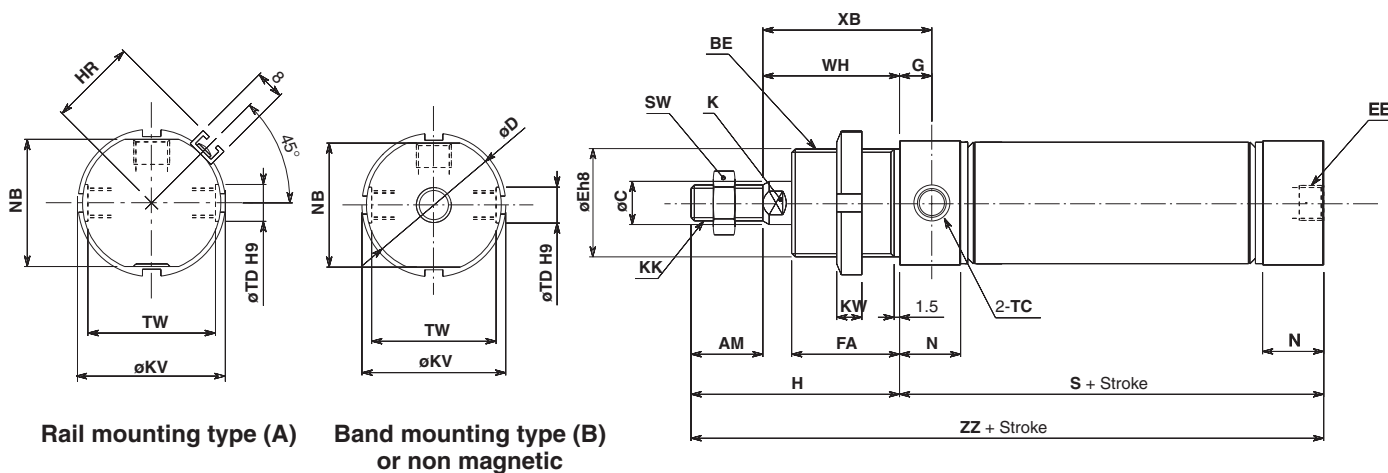
Dimensions

[First angle projection]

Single acting/Spring return, Single rod

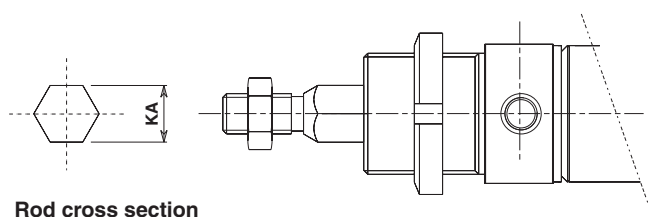
Rubber cushion: C□76Y Bore—Stroke S—□

Without magnet, Built-in magnet



C□76KY

Non-rotating, Piston rod



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | G | H | K | KA | KK | øKV | KW | HR | N | NB | SW | TC | øTDH9 | TW | WH | XB |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|----|------|------------|-----|----|------|----|------|----|---------|-----------------------------------|------|----|----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 9 | 58 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 23.8 | 17 | 34.5 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 12 | 69 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 28.3 | 22 | 42.5 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 |

| Bore | Item | | S | | | | | ZZ | | | | |
|------|--------|--|----------|-----------|------------|------------|------------|-----------|-----------|------------|------------|------------|
| | Stroke | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | | 68 (93) | 118 | 143 | 168 | — | 126 (151) | 176 | 201 | 226 | — |
| 40 | | | 89 (114) | 139 | 164 | 189 | 214 | 158 (183) | 208 | 233 | 258 | 283 |

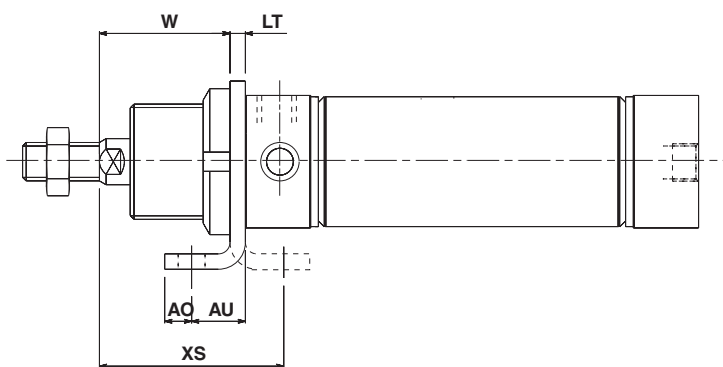
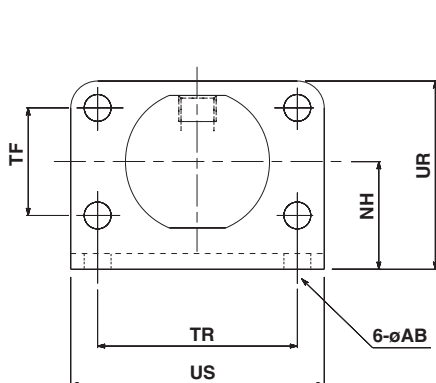
(): In the case of non-rotating

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

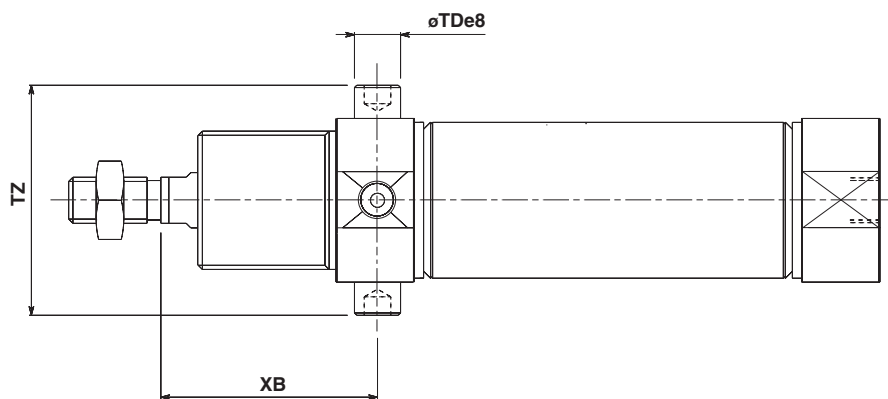
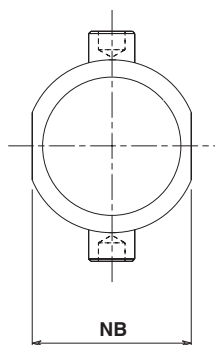
Dimensions with Mounting Bracket

[First angle projection]

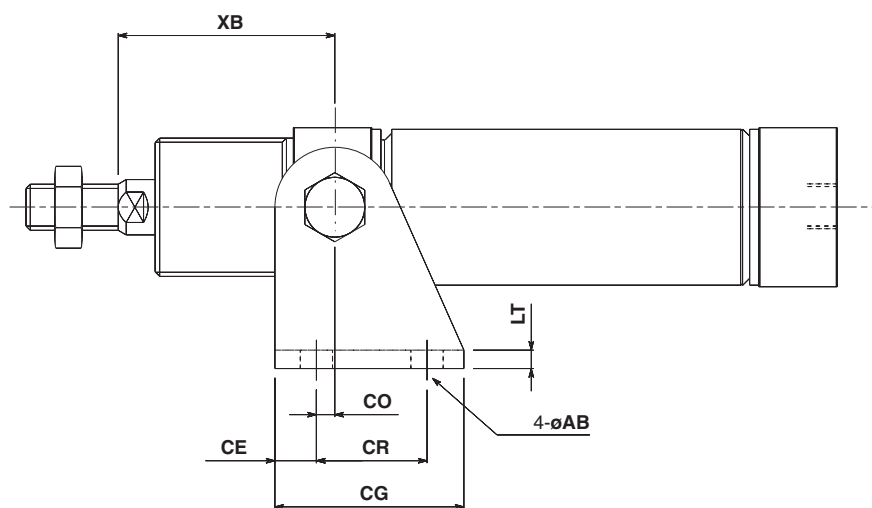
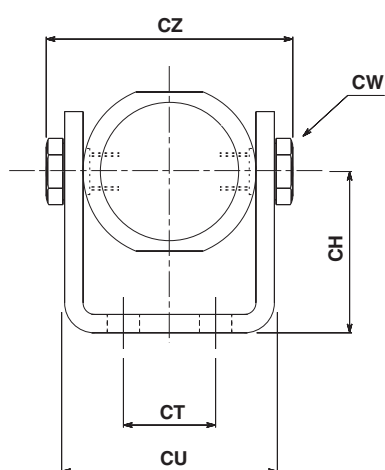
Single acting/Spring return, Single rod
Rod foot (Flange): C76F32A, C76F40A



Rod trunnion: C76T32, C76T40



Rod clevis: C76C32, C76C40



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

| (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-------------------|----|----|----|----|----|----|----|----|----|----|--------------|--------------------------------|------|----|------------|----|----|----|----|----|----|------|----|------|----|----|
| Bore | Rod foot (Flange) | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | | |
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | W | XS | NB | øTDes | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} -0.047 | 49.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} -0.058 | 62.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 |

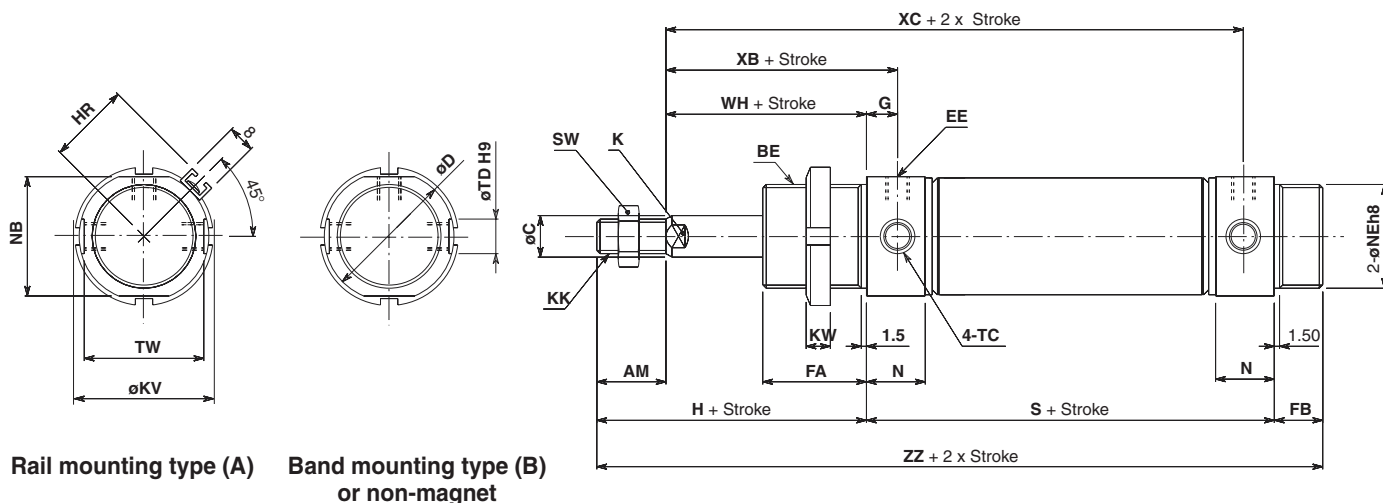
(mm)

Series C76

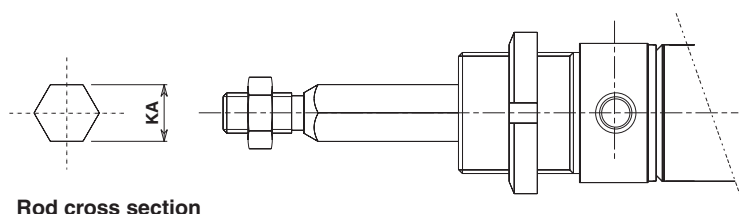
Dimensions

[First angle projection]

Single acting/Spring extended, Single rod
 Rubber cushion: C□76E Bore Stroke T□
 Without magnet, Built-in magnet



C□76KE
 Non-rotating, Piston rod



(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | FB | G | H | K | KA | KK | øKV | KW | HR | N | NB | SW | TC | øTDH9 | TW | WH | XB |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|----|----|------|------------|-----|----|------|----|------|----|---------|-----------------------------------|------|----|----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 14 | 9 | 58 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 23.8 | 17 | 34.5 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 16 | 12 | 69 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 28.3 | 22 | 42.5 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 |

| Item | | S | | | | | XC | | | | | ZZ | | | | |
|------|--------|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|
| Bore | Stroke | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | 93 | 118 | 143 | 168 | — | 122 | 147 | 172 | 197 | — | 165 | 190 | 215 | 240 | — |
| 40 | | 114 | 139 | 164 | 189 | 214 | 147 | 172 | 197 | 222 | 247 | 199 | 224 | 249 | 274 | 299 |

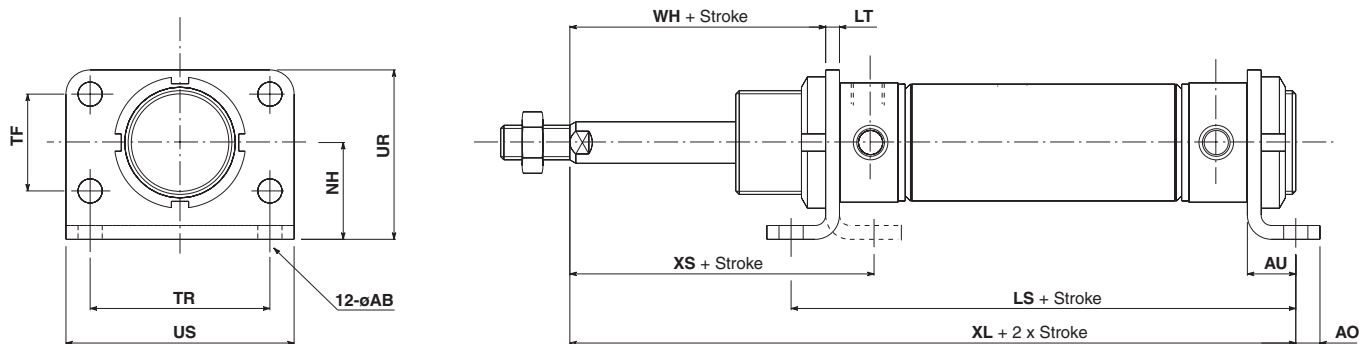
() : In the case of non-rotating

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

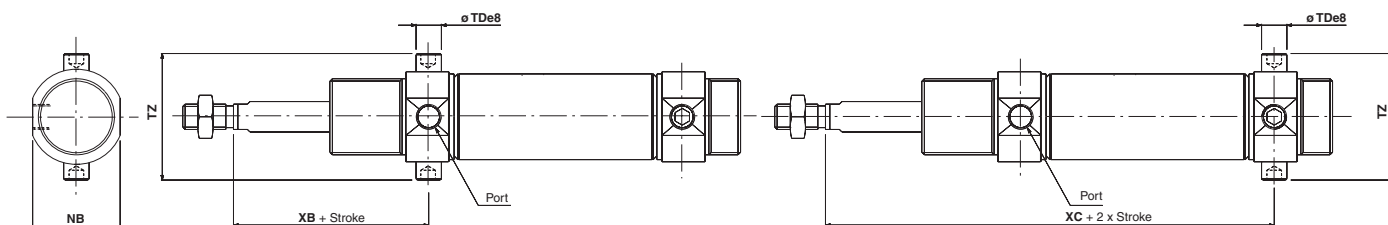
Dimensions with Mounting Bracket

[First angle projection]

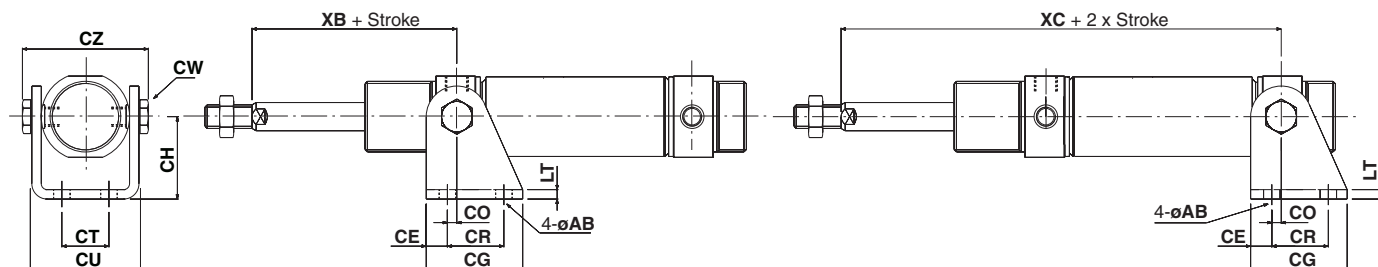
Single acting/Spring extended, Single rod
Rod foot (Flange): C76F32A, C76F40A



Rod trunnion, Head trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C76C40



(mm)

| Bore | Rod foot (Flange), Rod and head foot | | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | | |
|------|--------------------------------------|----|----|----|----|----|----|----|----|----|----|------|---------------------------------|------|----|-----|------------|----|----|----|----|----|------|----|------|----|----|--|
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | WH | XS | NB | øTDe8 | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB | |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025 -0.047} | 49.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 | |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032 -0.059} | 62.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 | |

| Bore | Stroke | Rod foot (Flange), Rod and head foot | | | | | | | | | | Head trunnion | | | | | | | | | |
|------|--------|--------------------------------------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|---------------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|
| | | LS | | | | | XL | | | | | XC | | | | | | | | | |
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | 121 | 146 | 171 | 196 | — | 145 | 170 | 195 | 220 | — | 122 | 147 | 172 | 197 | — | | | | | |
| 40 | | 154 | 179 | 204 | 229 | 254 | 179 | 204 | 229 | 254 | 279 | 147 | 172 | 197 | 222 | 247 | | | | | |

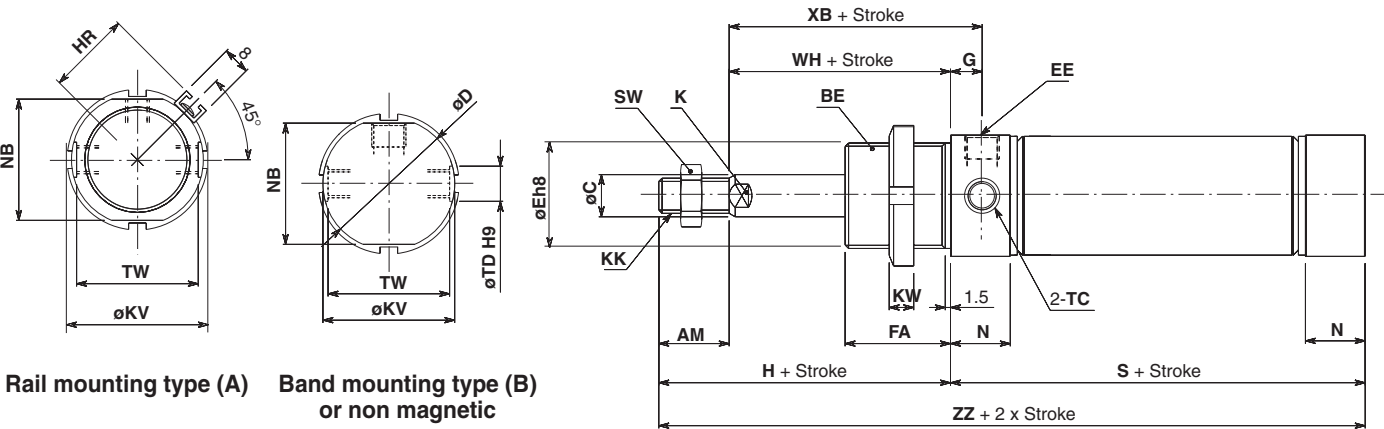
| Bore | Stroke | Head clevis | | | | |
|------|--------|-------------|-----------|------------|------------|-----------|
| | | XC | | | | |
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 20 to 250 |
| 32 | | 122 | 147 | 172 | 197 | — |
| 40 | | 147 | 172 | 197 | 222 | 247 |

Series C76

Dimensions

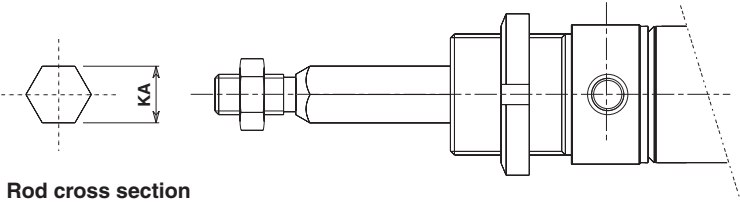
[First angle projection]

Single acting/Spring extended, Single rod
Rubber cushion: C□76F Bore Stroke T□
Without magnet, Built-in magnet



Rail mounting type (A) Band mounting type (B)
or non magnetic

C□76KF
Non-rotating, Piston rod



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | øEh8 | EE | FA | G | H | K | KA | KK | øKV | KW | HR | N | NB | SW | TC | øTDH9 | TW | WH | XB |
|------|----|-----------|----|------|-----------------------------------|-------|----|----|----|----|------|------------|-----|----|------|----|------|----|---------|-----------------------------------|------|----|----|
| 32 | 20 | M30 x 1.5 | 12 | 37.5 | 30 ⁰ _{-0.033} | G 1/8 | 30 | 9 | 58 | 10 | 12.2 | M10 x 1.5 | 38 | 7 | 23.8 | 17 | 34.5 | 17 | M8 x 1 | 10 ^{+0.036} ₀ | 34.5 | 38 | 47 |
| 40 | 24 | M38 x 1.5 | 14 | 46.5 | 38 ⁰ _{-0.039} | G 1/4 | 35 | 12 | 69 | 12 | 14.2 | M12 x 1.75 | 50 | 8 | 28.3 | 22 | 42.5 | 19 | M10 x 1 | 12 ^{+0.043} ₀ | 42.5 | 45 | 57 |

| Bore | Item | S | | | | | ZZ | | | | |
|------|--------|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|
| | Stroke | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
| 32 | | 93 | 118 | 143 | 168 | — | 151 | 176 | 201 | 226 | — |
| 40 | | 114 | 139 | 164 | 189 | 214 | 183 | 208 | 233 | 258 | 283 |

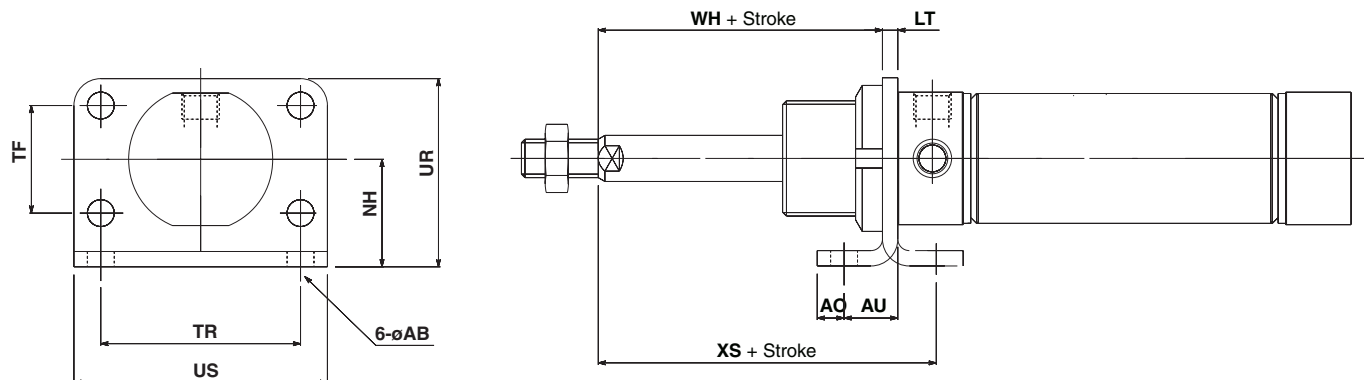
(): In the case of non-rotating

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

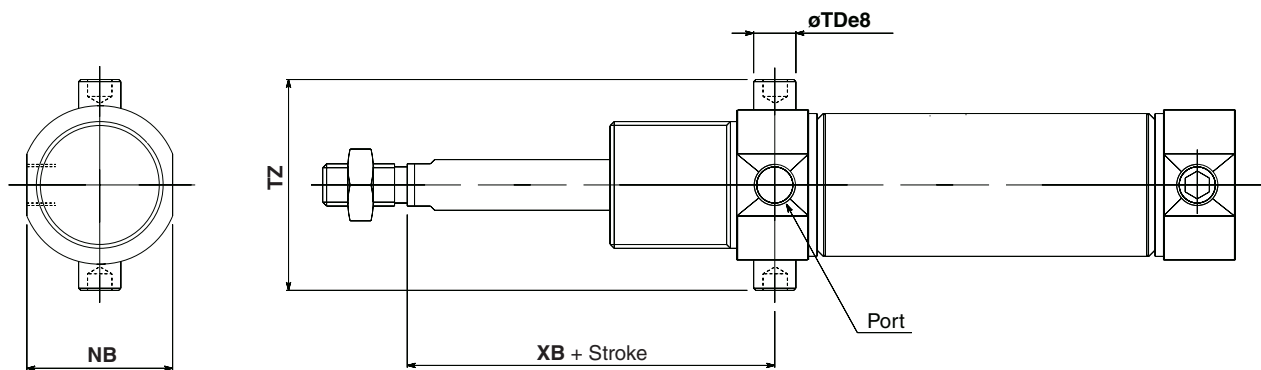
Dimensions with Mounting Bracket

[First angle projection]

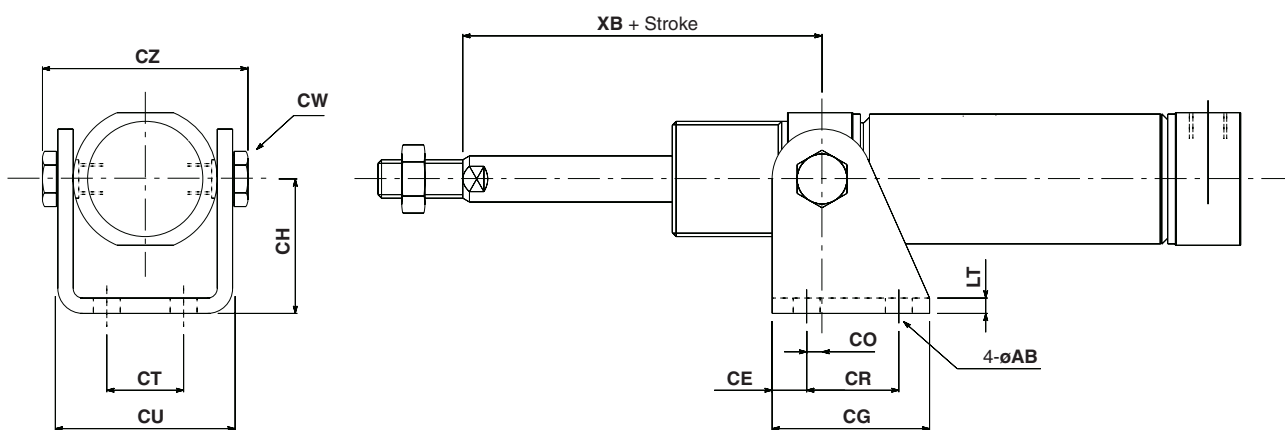
Single acting/Spring extended, Single rod
Rod foot (Flange): C76F32A, C76F40A



Rod trunnion: C76T32, C76T40



Rod clevis: C76C32, C76C40



(mm)

| Bore | Rod foot (Flange), Rod and head foot | | | | | | | | | | | | Rod trunnion | | | | Rod clevis | | | | | | | | | | | |
|------|--------------------------------------|----|----|----|----|----|----|----|----|----|----|------|--------------------------------|------|----|-----|------------|----|----|----|----|----|------|----|------|----|----|--|
| | øAB | AO | AU | LT | NH | TF | TR | UR | US | WH | XS | NB | øTDes | TZ | XB | øAB | CE | CG | CH | CO | CR | CT | CU | CW | CZ | LT | XB | |
| 32 | 7 | 7 | 14 | 4 | 28 | 28 | 52 | 49 | 66 | 34 | 48 | 34.5 | 10 ^{-0.025} -0.047 | 49.9 | 47 | 7 | 9 | 41 | 35 | 4 | 24 | 20 | 46.8 | 13 | 57.9 | 4 | 47 | |
| 40 | 9 | 10 | 20 | 5 | 33 | 30 | 60 | 58 | 80 | 40 | 60 | 42.5 | 12 ^{-0.032} -0.059 | 62.3 | 57 | 9 | 12 | 52 | 40 | 3 | 30 | 28 | 58.2 | 17 | 72.3 | 5 | 57 | |

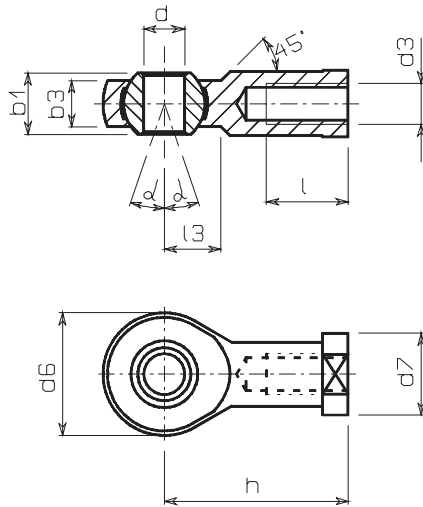
| |
|------------|
| CJ1 |
| CJP |
| CJ2 |
| CM2 |
| CG1 |
| MB |
| MB1 |
| CA2 |
| CS1 |
| C76 |
| C85 |
| C95 |
| CP95 |
| NCM |
| NCA |
| D- |
| -X |
| 20- |
| Data |

Series C76

Accessory Dimensions

[First angle projection]

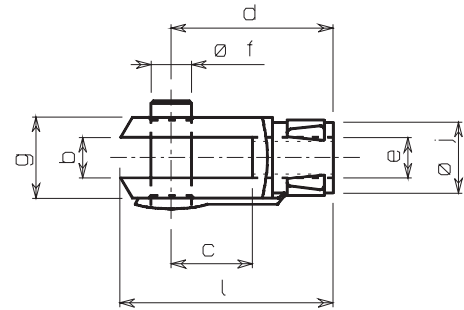
Single Knuckle Joint/DIN648-DIN 24335



(mm)

| Bore | Model | Thread d3 | dH71 | h | d6 | b3 | b1 | l | d7 | α^0 | l3 |
|------|--------|------------|------|----|----|------|----|----|----|------------|----|
| 32 | KJ10DA | M10 x 1.5 | 10 | 43 | 20 | 10.5 | 14 | 20 | 19 | 13 | 14 |
| 40 | KJ12DA | M12 x 1.75 | 12 | 50 | 30 | 12 | 16 | 22 | 22 | 13 | 16 |

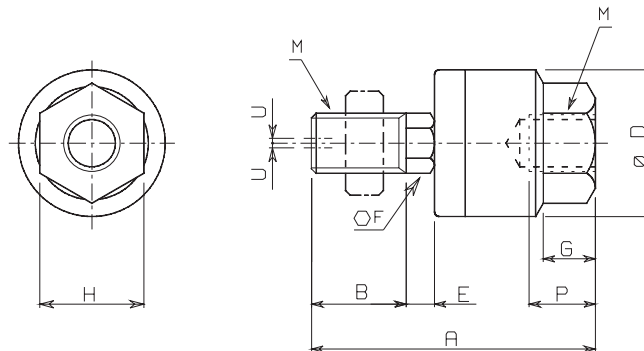
Double Knuckle Joint/ISO8140-DIN71752



(mm)

| Bore | Model | Thread e | b | d | f | g | c | j | a |
|------|-----------|------------|----|----|----|----|----|----|----|
| 32 | GKM10-20A | M10 x 1.5 | 10 | 40 | 10 | 18 | 20 | 12 | 20 |
| 40 | GKM12-24A | M12 x 1.75 | 12 | 48 | 12 | 23 | 24 | 15 | 24 |

Floating joint/Series JA JA25/40



(mm)

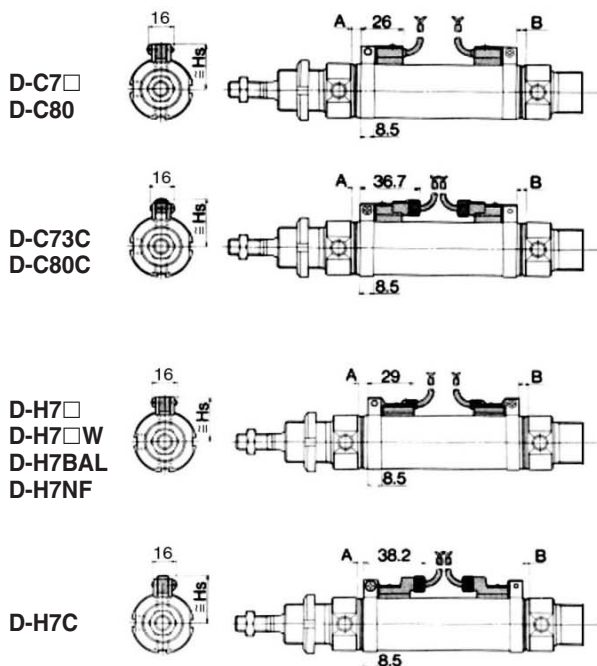
| Bore | Model | M | | A | B | D | E | F | G | H | Maximum screwed depth P | Allowable eccentricity U | Max. operating tension and compression power kgf (kN) |
|------|-------------|------------------------|-------|------|------|----|---|----|----|----|-------------------------------|-----------------------------|--|
| | | Nominal thread dia. | Pitch | | | | | | | | | | |
| 32 | JA25-10-150 | 10 | 1.5 | 49.5 | 19.5 | 24 | 5 | 8 | 8 | 17 | 9 | 0.5 | 250 (2.5) |
| 40 | JA40-12-175 | 12 | 1.75 | 60 | 20 | 31 | 6 | 11 | 11 | 22 | 13 | 0.75 | 440 (4.4) |

Air Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C76**

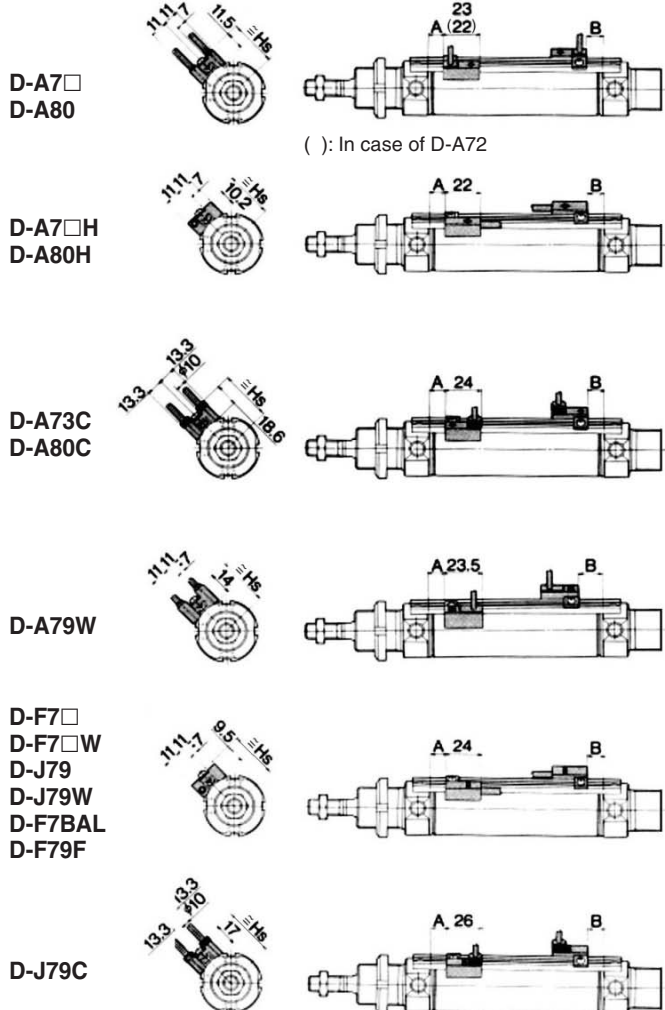
Auto Switch Mounting Position and Mounting Height

[First angle projection]

(Band mounting type)



(Rail Mounting type)



Auto Switch Mounting Position

(mm)

| Auto switch model | Bore | Single acting/Spring return | | | | | |
|-------------------|------|-----------------------------|--------------|---------------|---------------|---------------|------|
| | | A | | | | | B |
| | | 1 to 50 st | 51 to 100 st | 101 to 150 st | 151 to 200 st | 151 to 200 st | |
| D-C7□/C80 | 32 | 8 (33) | 58 | 83 | 108 | — | 7 |
| D-C73C/C80C | 40 | 13 (38) | 63 | 88 | 113 | 138 | 12 |
| D-A73 | 32 | 8.5 (33.5) | 58.5 | 83.5 | 108.5 | — | 7.5 |
| D-A80 | 40 | 13.5 (38.5) | 63.5 | 88.5 | 113.5 | 138.5 | 12.5 |
| D-A72/A7□H/A80H | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-A73C/A80C | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-F7□/F7□W | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-J79/J79W | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-F7□WV | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-J79C | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-F7BAL, D-F79F | 32 | 9 (34) | 59 | 84 | 109 | — | 8 |
| D-A79WL | 32 | 6 (31) | 56 | 81 | 106 | — | 5 |
| D-A79WL | 40 | 11 (36) | 61 | 86 | 111 | 136 | 10 |
| D-H7□/H7C | 32 | 7 (32) | 57 | 82 | 107 | — | 6 |
| D-H7□W | 32 | 7 (32) | 57 | 82 | 107 | — | 6 |
| D-H7BAL, D-H7NF | 40 | 12 (37) | 62 | 87 | 112 | 137 | 11 |

• () For air cushion type

• Aim at this number

Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H D-A80H | D-F7□/J79 D-F7□W D-J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C |
|------|---|------------------|----------------|------------------|--|------------------|-------|--------|--------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 32 | 28.5 | 31 | 30.5 | 28 | 30 | 36 | 31.5 | 31.5 | 34.5 |
| 40 | 32.5 | 35 | 35 | 5 | 34.5 | 40.5 | 35.5 | 36 | 39 |

• Aim at this number

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

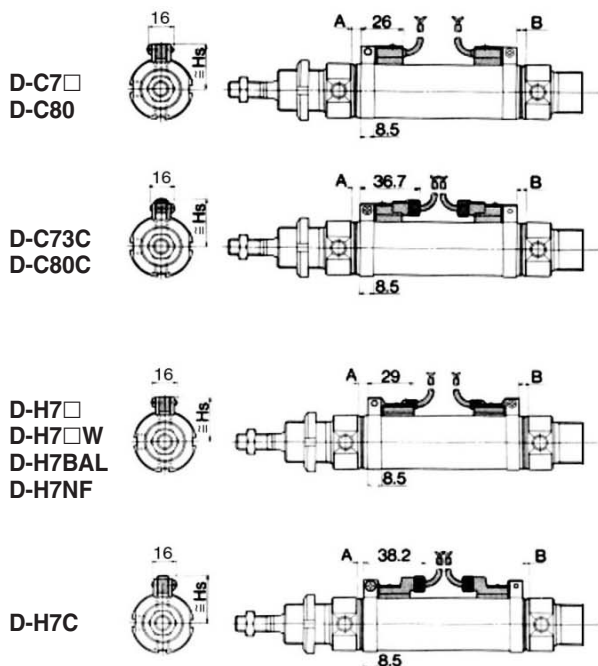
Data

Series C76

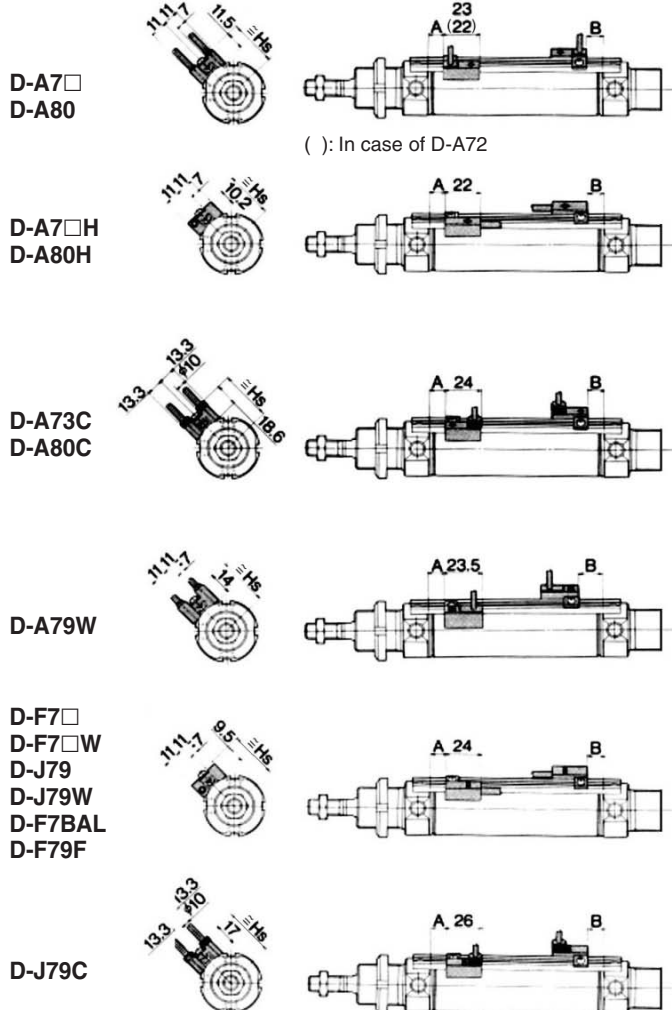
Auto Switch Mounting Position and Mounting Height

[First angle projection]

(Band mounting type)



(Rail Mounting type)



Auto Switch Mounting Position

(mm)

| Auto switch model | Bore | Single acting/Spring extended | | | | | |
|-------------------|------|-------------------------------|------------|--------------|---------------|---------------|---------------|
| | | A | B | | | | |
| | | | 1 to 50 st | 51 to 100 st | 101 to 150 st | 151 to 200 st | 151 to 200 st |
| D-C7□/C80 | 32 | 8 | 32 | 57 | 82 | 107 | — |
| D-C73C/C80C | 40 | 13 | 37 | 62 | 87 | 112 | 137 |
| D-A73 | 32 | 8.5 | 32.5 | 57.5 | 82.5 | 107.5 | — |
| D-A80 | 40 | 13.5 | 37.5 | 62.5 | 87.5 | 112.5 | 137.5 |
| D-A72/A7□H/A80H | 32 | 9 | 33 | 58 | 83 | 108 | — |
| D-A73C/A80C | 32 | 9 | 33 | 58 | 83 | 108 | — |
| D-F7□/F7□W | 32 | 9 | 33 | 58 | 83 | 108 | — |
| D-J79/J79W | 32 | 9 | 33 | 58 | 83 | 108 | — |
| D-F7□WV | 32 | 9 | 33 | 58 | 83 | 108 | — |
| D-J79C | 40 | 14 | 38 | 63 | 88 | 113 | 138 |
| D-F7BAL, D-F79F | 40 | 14 | 38 | 63 | 88 | 113 | 138 |
| D-A79WL | 32 | 6 | 30 | 55 | 80 | 105 | — |
| D-A79WL | 40 | 11 | 35 | 60 | 85 | 110 | 135 |
| D-H7□/H7C | 32 | 7 | 31 | 56 | 81 | 106 | — |
| D-H7□W | 32 | 7 | 31 | 56 | 81 | 106 | — |
| D-H7BAL, D-H7NF | 40 | 12 | 36 | 61 | 86 | 111 | 136 |

• Aim at this number

Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H D-A80H | D-F7□/J79 D-F7□W D-J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C |
|------|---|------------------|----------------|------------------|--|------------------|-------|--------|--------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 32 | 28.5 | 31 | 30.5 | 28 | 30 | 36 | 31.5 | 31.5 | 34.5 |
| 40 | 32.5 | 35 | 35 | 5 | 34.5 | 40.5 | 35.5 | 36 | 39 |

• Aim at this number

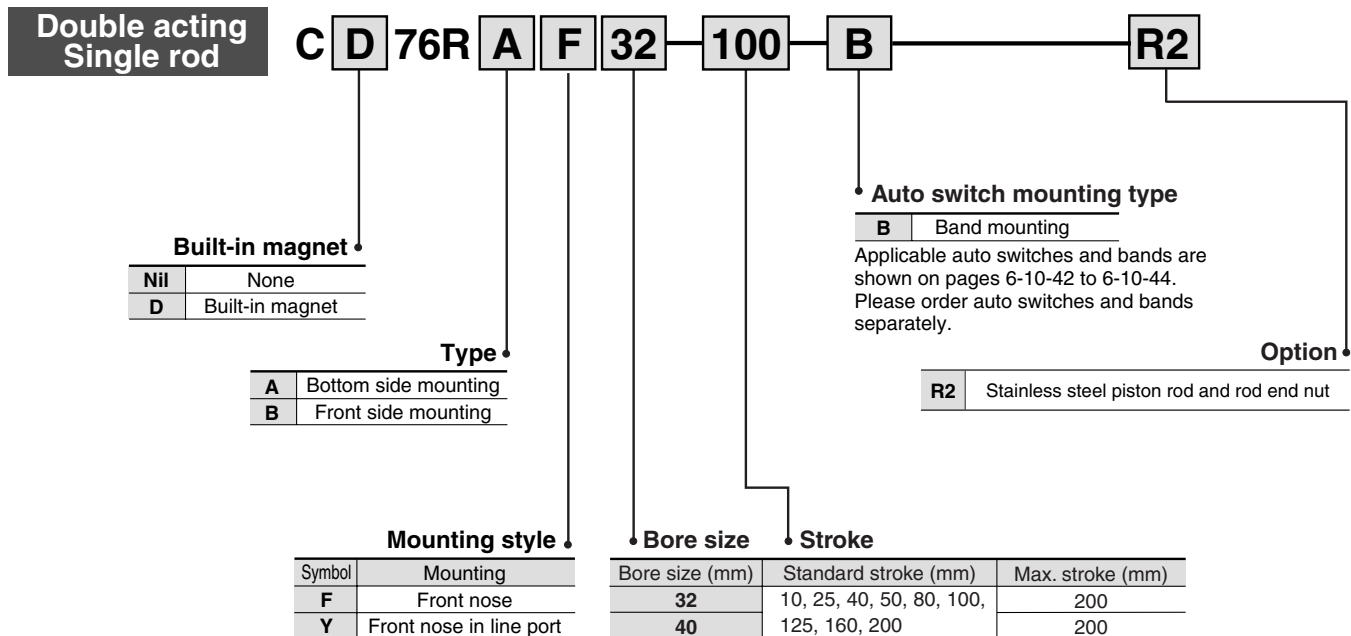
Air Cylinder: Direct Mount Type

Double Acting, Single Rod

Series C76R

ø32, ø40

How to Order



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Mounting Bracket Part No.

| Bore size (mm) | | 32 | 40 |
|----------------|----------------------|-------------|-------------|
| Accessory | Single knuckle joint | KJ10DA | KJ12DA |
| | Double knuckle joint | GKM10-20A | GKM12-24A |
| | Floating joint | JA25-10-150 | JA40-12-175 |

Replacement Parts

| Bore (mm) | Part no. | Note |
|-----------|----------|---|
| 32 | C76-32PS | Every set includes: 1 rod seal |
| 40 | C76-40PS | 1 seal retaining washer 1 retaining ring |

Example of How to Order

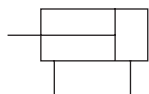
- Cylinder without auto switch, Bore size: 32, Stroke: 100, Double acting/Single rod, Bottom side mounting and Boss-cut type.
C76RAF32-100 1 pc. Cylinder
- Cylinder with auto switch (Band mounted type, 2 pcs.), Bore size: 40, Stroke: 100, Double acting/Single rod, Front side mounting and Front nose type.
CD76RBF40-100-B 1 pc. Cylinder
C-D73L 2 pcs. Auto switch
BM2-040 2 pcs. Switch mounting band

Series C76R



JIS Symbol

Double acting, Single rod



Specifications

| Bore size (mm) | 32 | 40 |
|-------------------------------|---|------------|
| Piston rod dia. (mm) | 12 | 14 |
| Piston rod thread | M10 x 1.5 | M12 x 1.75 |
| Port size | G 1/8 | G 1/4 |
| Action | Double acting, Single Rod | |
| Fluid | Air | |
| Proof pressure | 1.5 MPa | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.05 MPa | |
| Ambient and fluid temperature | -20 to 80°C (Built-in magnet type: -10 to 60°C) | |
| Cushion | Rubber cushion | |
| Lubrication | None (Non-lube) | |
| Piston speed | 50 to 1500 mm/s | |
| Allowable kinetic energy | 0.65 J | 1.2 J |

Auto Switch Mounting, Minimum Possible Cylinder Stroke

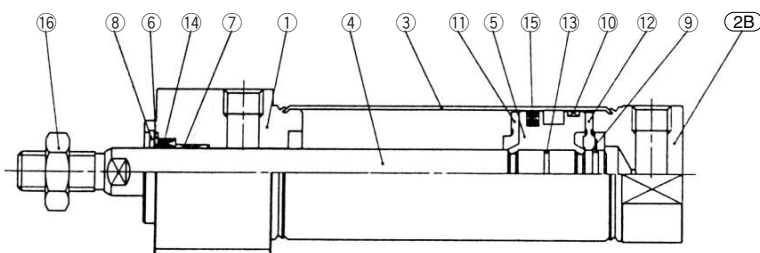
Band Mounting Type

(mm)

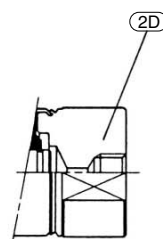
| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|--------------|---|------------------|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $50 + 45(n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $65 + 50(n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $60 + 45(n - 2)$ | 10 |

Construction

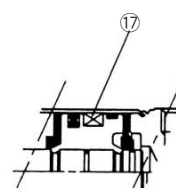
C□76R^A_B32 to 40



Standard: Front nose



Front nose in line port



Built-in magnet

Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②B | Head cover E | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑨ | Retaining ring | Stainless steel | 1 | |
| ⑩ | Wear ring | Resin | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------|--------------|------|--------------------|
| ⑪ | Bumper A | Urethane | 1 | |
| ⑫ | Bumper B | Urethane | 1 | |
| ⑬ | Piston gasket | NBR | 1 | |
| ⑭ | Rod seal | NBR | 1 | |
| ⑮ | Piston seal | NBR | 1 | |
| ⑯ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑰ | Magnet | Magnet | 1 | (Switch type only) |

Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series C76R**

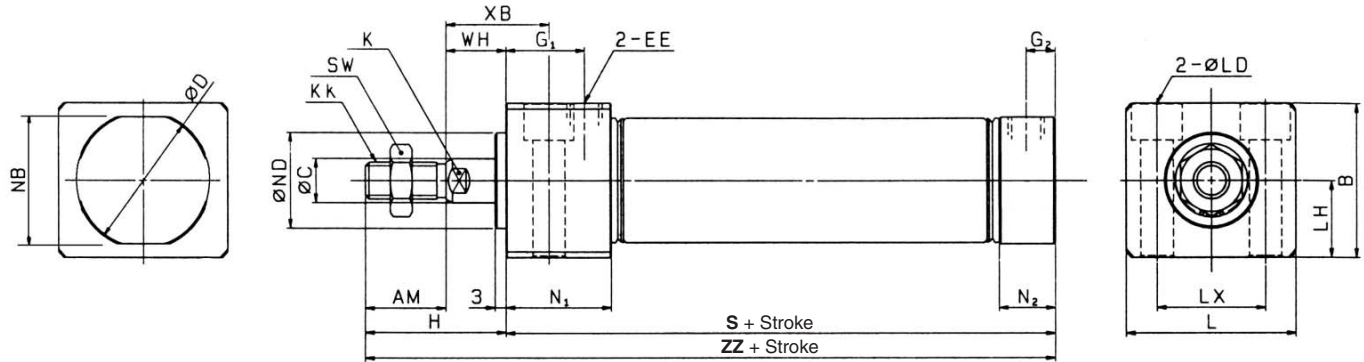
Dimensions

[First angle projection]

Double acting, Single rod

Rubber cushion: C□76RAF **Bore** **Stroke** -B

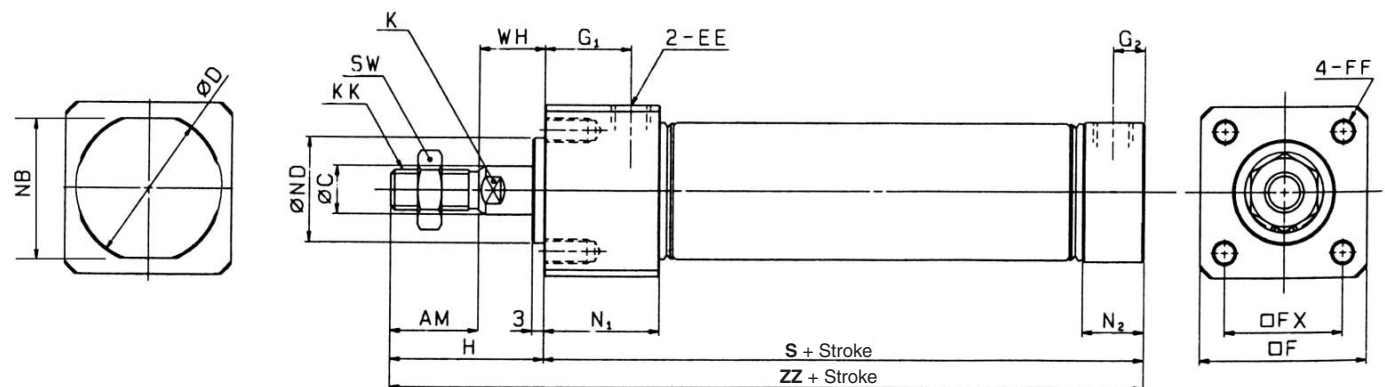
Without magnet, Built-in magnet



| Bore | AM | B | ϕC | ϕD | EE | G1 | G2 | H | K | KK | L | ϕLD | LH | LX | N1 | N2 | NB | ϕND_{h8} | S | SW | WH | XB | ZZ |
|------|----|------|----------|----------|-------|----|----|----|----|------------|------|--|----|----|----|----|------|--------------------|-----|----|----|----|-----|
| 32 | 20 | 42.3 | 12 | 37.5 | G 1/8 | 22 | 9 | 36 | 10 | M10 x 1.5 | 47 | $\phi 9, \phi 14$ depth of counterbore 10 | 21 | 30 | 29 | 17 | 34.5 | $26^{+0}_{-0.033}$ | 80 | 17 | 16 | 28 | 116 |
| 40 | 24 | 52.3 | 14 | 46.5 | G 1/4 | 27 | 12 | 40 | 12 | M12 x 1.75 | 58.5 | $\phi 11, \phi 17.5$ depth of counterbore 12.5 | 26 | 38 | 38 | 22 | 42.5 | $32^{+0}_{-0.039}$ | 105 | 19 | 16 | 31 | 145 |

Rubber cushion: C□76RBF **Bore** **Stroke** -B

Without magnet, Built-in magnet



| Bore | AM | ϕC | ϕD | EE | F | FF | FX | G1 | G2 | H | K | KK | N1 | N2 | NB | ϕND_{h8} | S | SW | WH | ZZ |
|------|----|----------|----------|-------|------|-------------------|----|----|----|----|----|------------|----|----|------|--------------------|-----|----|----|-----|
| 32 | 20 | 12 | 37.5 | G 1/8 | 42.4 | M6 x 1 dept 11 | 30 | 22 | 9 | 36 | 10 | M10 x 1.5 | 29 | 17 | 34.5 | $26^{+0}_{-0.033}$ | 80 | 17 | 16 | 116 |
| 40 | 24 | 14 | 46.5 | G 1/4 | 52.4 | M8 x 1.25 dept 14 | 36 | 27 | 12 | 40 | 12 | M12 x 1.75 | 38 | 22 | 42.5 | $32^{+0}_{-0.039}$ | 105 | 19 | 16 | 145 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C76R

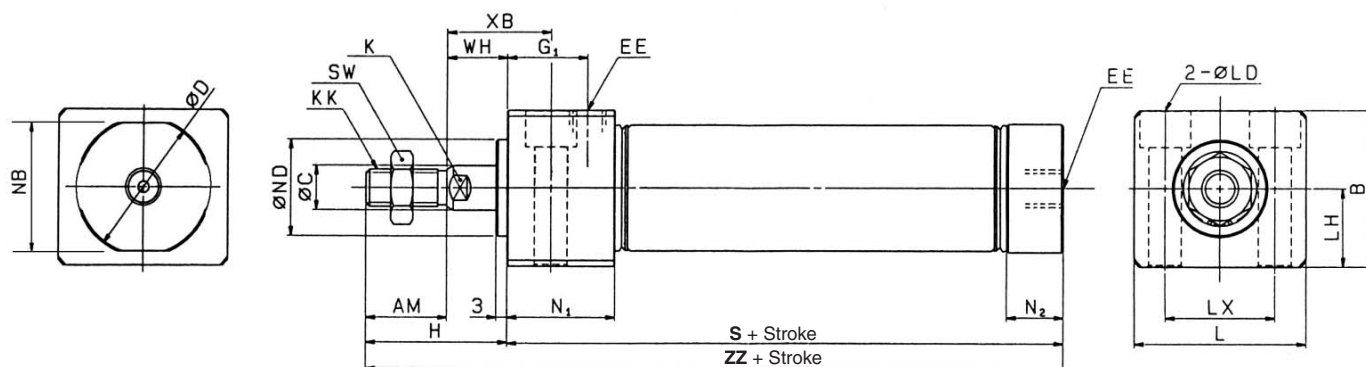
Dimensions

[First angle projection]

Double acting, Single rod

Rubber cushion: C76RAY **Bore**—**Stroke**—B

Without magnet, Built-in magnet

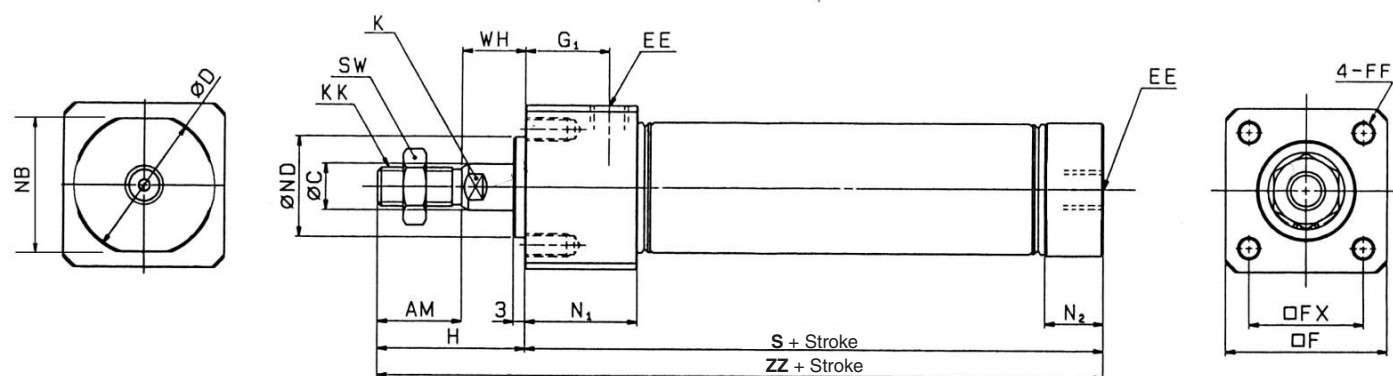


(mm)

| Bore | AM | B | øC | øD | EE | G1 | H | K | KK | L | øLD | LH | LX | N1 | N2 | NB | øNDh8 | S | SW | WH | XB | ZZ |
|-----------|----|------|----|------|------|----|----|----|------------|------|---------------------------------------|----|----|----|----|------|-----------------------------------|-----|----|----|----|-----|
| 32 | 20 | 42.3 | 12 | 37.5 | G1/8 | 22 | 36 | 10 | M10 x 1.5 | 47 | ø9, ø14 depth of counter bore 10 | 21 | 30 | 29 | 17 | 34.5 | 26 ⁰ _{-0.033} | 80 | 17 | 16 | 28 | 116 |
| 40 | 24 | 52.3 | 14 | 46.5 | G1/4 | 27 | 40 | 12 | M12 x 1.75 | 58.5 | ø11, ø17.5 depth of counter bore 12.5 | 26 | 38 | 38 | 22 | 42.5 | 32 ⁰ _{-0.039} | 105 | 19 | 16 | 31 | 145 |

Rubber cushion: C□76RBY **Bore**—**Stroke**—**B**

Without magnet, Built-in magnet



(mm)

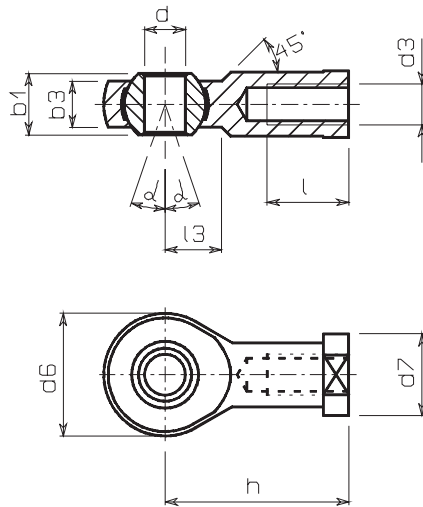
| Bore | AM | øC | øD | EE | F | FF | FX | G1 | H | K | KK | N1 | N2 | NB | øNDh8 | S | SW | WH | ZZ |
|-----------|----|----|------|-------|------|--------------------|----|----|----|----|------------|----|----|------|--|-----|----|----|-----|
| 32 | 20 | 12 | 37.5 | G 1/8 | 42.4 | M6 x 1 depth 11 | 30 | 22 | 36 | 10 | M10 x 1.5 | 29 | 17 | 34.5 | $26 \begin{smallmatrix} 0 \\ -0.033 \end{smallmatrix}$ | 80 | 17 | 16 | 116 |
| 40 | 24 | 14 | 46.5 | G 1/4 | 52.4 | M8 x 1.25 depth 14 | 36 | 27 | 40 | 12 | M12 x 1.75 | 38 | 22 | 42.5 | $32 \begin{smallmatrix} 0 \\ -0.039 \end{smallmatrix}$ | 105 | 19 | 16 | 145 |

Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series C76R**

Accessory Dimensions

[First angle projection]

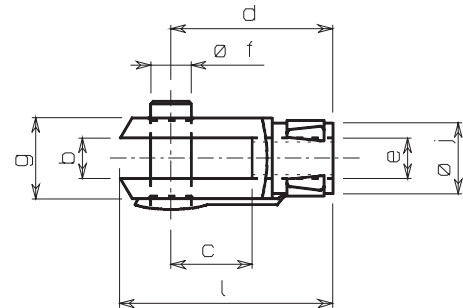
Single Knuckle Joint/DIN648



(mm)

| Bore | Model | Thread d3 | dH71 | h | d6 | b3 | b1 | l | d7 | α° | l3 |
|------|--------|------------|------|----|----|------|----|----|----|----------------|----|
| 32 | KJ10DA | M10 x 1.5 | 10 | 43 | 20 | 10.5 | 14 | 20 | 19 | 13 | 14 |
| 40 | KJ12DA | M12 x 1.75 | 12 | 50 | 30 | 12 | 16 | 22 | 22 | 13 | 16 |

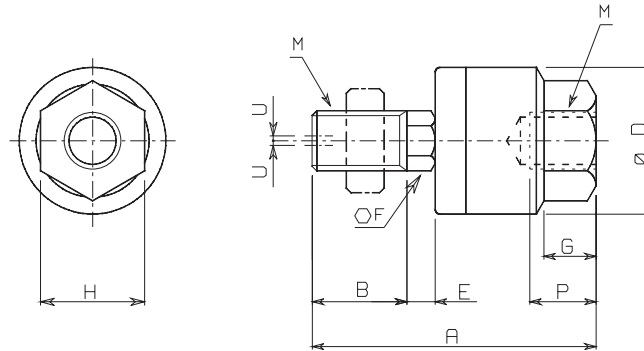
Double Knuckle Joint/DIN71751



(mm)

| Bore | Model | Thread e | b | d | f | g | c | j | a |
|------|-----------|------------|----|----|----|----|----|----|----|
| 32 | GKM10-20A | M10 x 1.5 | 10 | 40 | 10 | 18 | 20 | 12 | 20 |
| 40 | GKM12-24A | M12 x 1.75 | 12 | 48 | 12 | 23 | 24 | 15 | 24 |

Floating joint/Series JA JA25/40



(mm)

| Bore | Model | M | | A | B | D | E | F | G | H | Maximum screwed depth P | Allowable eccentricity U | Max. operating tension and compression power kgf (kN) |
|------|-------------|------------------------|-------|------|------|----|---|----|----|----|-------------------------------|-----------------------------|--|
| | | Nominal thread dia. | Pitch | | | | | | | | | | |
| 32 | JA25-10-150 | 10 | 1.5 | 49.5 | 19.5 | 24 | 5 | 8 | 8 | 17 | 9 | 0.5 | 250 (2.5) |
| 40 | JA40-12-175 | 12 | 1.75 | 60 | 20 | 31 | 6 | 11 | 11 | 22 | 13 | 0.75 | 440 (4.4) |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

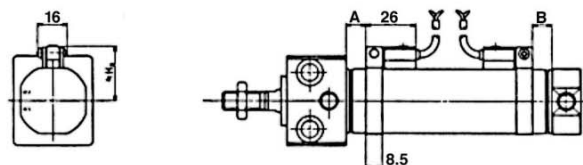
Series C76R

Auto Switch Mounting, Position and Mounting Height

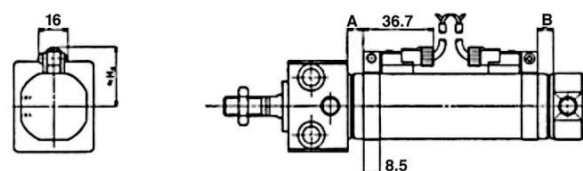
Reed Switch Setting Position (Stroke end)

(Band mounting type)

D-C7□
D-C80



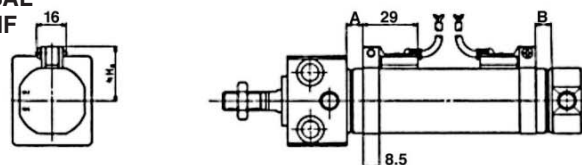
D-C73C
D-C80C



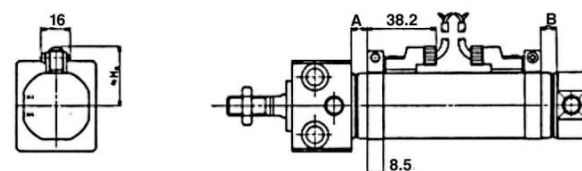
Solid State Switch Setting Position (Stroke end)

(Band mounting type)

D-H7□
D-H7□W
D-H7BAL
D-H7NF



D-H7C



Auto Switch Mounting Position (mm)

| Bore | D-C7□ D-C80 D-C73C D-C80C | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | |
|------|------------------------------------|----|---|----|
| | A | B | A | B |
| 32 | 8 | 7 | 7 | 6 |
| 40 | 14 | 12 | 13 | 11 |

• Aim at this number.

Auto Switch Mounting Height (mm)

| Bore | D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-H7C |
|------|--|------------------|-------|
| | Hs | Hs | Hs |
| 32 | 28.5 | 31 | 31.5 |
| 40 | 32.5 | 35 | 35.5 |

• Aim at this number.

Applicable Auto Switch

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | | Auto switch model** | | | Lead wire length* (mm) | | | | Applicable load | | |
|---------------------------------|----------------------------------|------------------|-----------------|-----------------|--------------|-----------|-------|---------------------|---------------|-------|------------------------|-------|------------|----------|-----------------|------------|------------|
| | | | | | DC | | AC | Band mounting | Rail mounting | | 0.5 (—) | 3 (L) | 5 (Z) | None (N) | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | — | |
| | | | | 2-wire | — | — | 200 V | — | A72 | A72H | ● | ● | — | — | — | | Relay, PLC |
| | | | 24 V | | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | |
| | | 5 V, 12 V | | | ≤ 100 V | C80 | A80 | A80H | ● | ● | — | — | IC circuit | | | | |
| | | 12 V | | | — | C73C | A73C | — | ● | ● | ● | ● | — | — | | | |
| | Connector | Yes | | 5 V, 12 V | ≤ 24 V | C80C | A80C | — | ● | ● | ● | ● | IC circuit | | | | |
| | | No | — | — | — | A79W | — | ● | ● | — | — | — | | | | | |
| Diagnostic indication (2-color) | Grommet | Yes | — | — | — | A79W | — | ● | ● | — | — | — | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | IC circuit | Relay, PLC | |
| | | | | 3-wire (PNP) | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | — | | |
| | | Connector | | 2-wire | | 12 V | | — | H7B | F7BV | J79 | ● | ● | ○ | — | | — |
| | — | | | H7C | | J79C | | — | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | IC circuit | | |
| | | | | 3-wire (PNP) | | | | H7PW | — | F7PW | ● | ● | ○ | — | — | | |
| | Water resistant (2-color) | | | 2-wire | | 12 V | | — | H7BW | F7BWV | J79W | — | ● | ○ | — | | — |
| | | | | — | | H7BA | | F7BAV | F7BA | — | ● | ○ | — | — | | | |
| | With timer | | | 3-wire (NPN) | | 5 V, 12 V | | — | — | F7NT | ● | ● | ○ | — | — | | |
| | With diagnostic output (2-color) | | | 4-wire (NPN) | | | | H7NF | — | F79F | ● | ● | ○ | — | IC circuit | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 5 m Z (Example) C73CZ
 3 m L (Example) C73CL
 None N (Example) C73CN

* Solid state switches marked with "○" are manufactured upon receipt of order.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

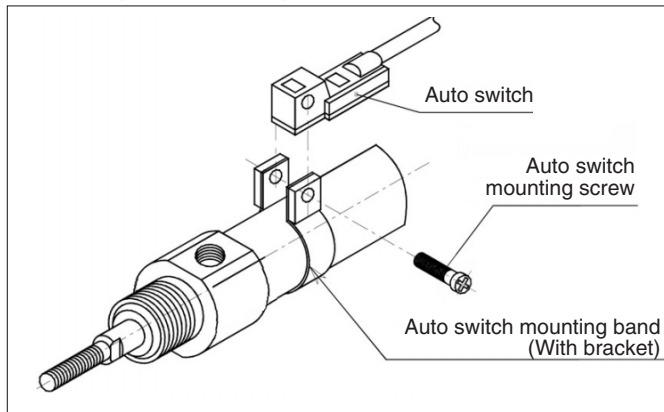
Series C76

Mounting Bracket Band mounting type

<Applicable auto switch>

D-C7□/C80, D-C73C/C80C, D-H7□, D-H7C,
D-H7□W, D-H7BAL, D-H7NF

Mounting and Moving Method of Auto Switch



1. Put a mounting band on the cylinder tube and position the auto switch.
2. Put the mounting part of auto switch in the middle of the stationary fitting, aligning the mounting hole with the hole of the stationary fitting.
3. Screw in the auto switch mounting screw through the mounting hole into the threaded part of the band fitting.
4. Set the whole body to the detecting position by sliding, then tighten the mounting screw to fix the auto switch (the tightening torque of M3 screw should be about 80 to 100 N/cm).
5. Modification of the detecting position should be made following step #3.

Auto Switch Mounting Band Part No.

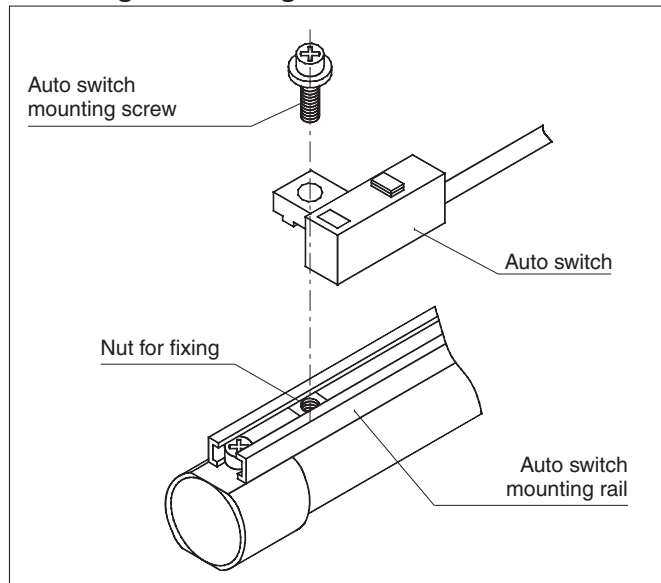
| Series | Bore size (mm) | |
|--------|----------------|---------|
| | 32 | 40 |
| C76 | BM2-032 | BM2-040 |

Mounting Bracket Rail mounting type

<Applicable auto switch>

D-A7□/A80, D-A73C/A80C, D-F7□/J7□, D-J79C,
D-F7□W, D-J79W, D-F7BAL, D-F7□WV, D-F7BAVL,
D-F79F

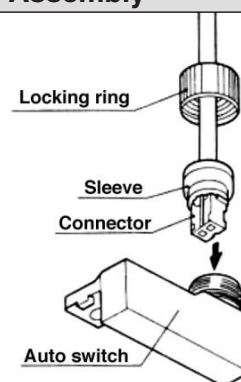
Mounting and Moving Method of Auto Switch



1. Slide the nut located inside the mounting rail and set it at the auto switch mounting position.
2. Fit the convex part of the auto switch mounting arm into the slot of the rail and slide it to the nut position.
3. Allow the auto switch mounting screw to match gently in the nut for attachment, and screw it in.
4. Check the detecting position again and tighten the mounting screw to fix the auto switch definitely (the tightening torque of M3 screw should be about 50 to 70 N/cm).
5. Modification of the detecting position should be made following step #3.

Plug-in Connector Assembly

D-C73C/C80C
D-H7C
D-A73C/A80C
D-J79C



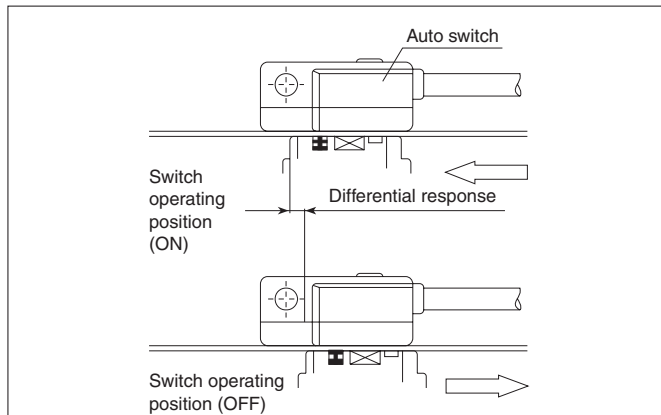
With the convex port of the connector highest, insert the connector into the auto switch up to the sleeve. Screw the locking ring into the switch (do not tighten with pliers, hand tighten only).

Lead Wire with Connector

| Part no. | Length |
|----------|--------|
| D-LC05 | 0.5 m |
| D-LC30 | 3 m |
| D-LC50 | 5 m |

Differential Response of Auto Switch

The distance from the operating position of auto switch to the returning position is called the differential response. This response is included in part of the operating range (one side).



The difference between the operating position (ON) of switch and the returning position (OFF) is 2 mm or less in a reed switch and 1 mm or less in a solid state switch.

Operating Range of Auto Switch

(mm)

| Mounting | Model | Bore | |
|----------|---------------------|------|-----|
| | | 32 | 40 |
| Band | D-C7□/C80/C73C/C80C | 8 | 8 |
| | D-H7□/H7□W/H7BAL | 4.5 | 5 |
| | D-H7C | 9 | 10 |
| Rail | D-A7□/A80/A7□H/A80 | 8 | 8 |
| | D-A73C/A80C | | |
| | D-A79W | 13 | 14 |
| | D-F7□/J79/F7□W/J79W | | |
| | D-F7□V/F7□WV/F79F | 6 | 6.5 |
| | D-J79C/F7BA□ | | |

Contact Protective Box/CD-P11, CD-P12

The auto switch of D-A7/A8 type, D-A7□H/A80H type, D-A73C/A80C type, D-C7/C8 type, D-C73C/C80C type are not incorporated with a contact protective circuit.

1. Operating load is inductive.
2. The wiring length to load is 5 m or less.
3. The load voltages are 100 or 200 VAC. Either voltage should be used with the contact protective box.

Contact Protective Box of Specifications

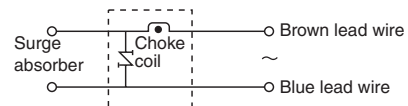
| Part no. | CD-P11 | | CD-P12 |
|-------------------|---------|---------|--------|
| Load voltage | 100 VAC | 200 VAC | 24 VDC |
| Max. load current | 25 mA | 12.5 mA | 50 mA |

Lead wire length Switch connecting side 0.5 m
Load connecting side 0.5 m

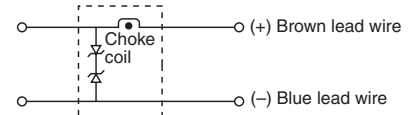


Contact Protective Box/Internal Circuit

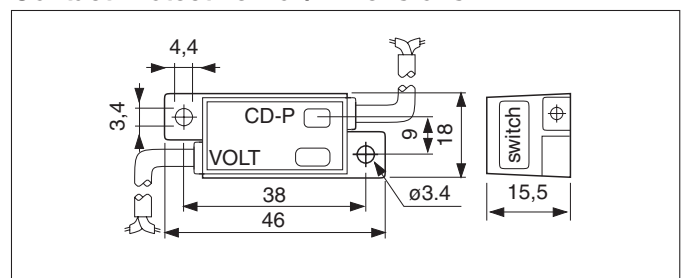
CD-P11



CD-P12



Contact Protective Box/Dimensions



Contact Protective Box/Dimensions

For connection of the switch body and the contact protective box, connect the load in the side indicated and switch on the contact protective box to the lead from the switch body. The length of lead between the switch body and the contact protective box should be within 1 m and they should be set as close together as possible.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C76

1 High Temperature XB6

C76 Mounting Bore size – Stroke – XB6

E, F, Y 32, 40 mm

Standard cylinder seals are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a high ambient temperature (–10 to 150°C).

Possible applications:

- Bore size 32 and 40 mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at high temperature.)
- Single rod — Double acting
- Double rod — Double acting (W)

Dimensions unchanged

Specifications

| | |
|---------------------------|--|
| Type | Air cylinder |
| Applicable size | ø32, ø40 mm |
| Action | Double acting |
| Ambient temperature range | –10 to 150°C |
| Piston speed | 50 to 500 mm/s |
| Cushion | Rubber bumper |
| Material | Seal: Fluorocarbon rubber Wear ring: Fluorocarbon resin |
| Grease | Fluorinated grease |

Note) Contact SMC for non-rotating type.

3 Low Speed XB9

C76 Mounting Bore size – Stroke – XB9

E, F, Y 32, 40 mm

The cylinder does not generate any stick-slip phenomenon even at the rated low speed of 10 to 50 mm/s.

All strokes drive at a constant speed smoothly.

Possible applications:

- Bore size 32 and 40 mm
- Rubber bumper type only
- With or without magnets
- Single rod — Double acting

Dimensions unchanged

Specifications

| | |
|-----------------|---------------|
| Type | Air cylinder |
| Applicable size | ø32, ø40 mm |
| Action | Double acting |
| Piston speed | 10 to 50 mm/s |
| Cushion | Rubber bumper |

Note) Contact SMC for non-rotating type.

2 Low Temperature XB7

C76 Mounting Bore size – Stroke – XB7

E, F, Y 32, 40 mm

Standard cylinder packing are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a low ambient temperature (–55 to 70°C).

Possible applications:

- Bore size 32 and 40 mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at low temperature.)
- Single rod — Double acting
- Double rod — Double acting (W)

Dimensions unchanged

Specifications

| | |
|---------------------------|---|
| Type | Air cylinder |
| Applicable size | ø32, ø40 mm |
| Action | Double acting |
| Ambient temperature range | –55 to 70°C |
| Cushion | Rubber bumper |
| Material | Seal: Low nitrile rubber Wear ring: Fluorocarbon resin |
| Grease | Fluorinated grease |

Note) Contact SMC for non-rotating type.

4 Heavy-duty Scraper XC4

C76 Mounting Bore size – Stroke – XC4

E, F, Y 32, 40 mm

A heavy-duty scraper is used as wiper ring. Ideal for severe applications where the cylinder is exposed to dust, earth and sand. Applicable to casting machines, construction machines, industrial vehicles, etc.

Possible applications:

- Bore size 32 and 40 mm
- Rubber bumper type only
- With or without magnets
- Single rod — Double acting
- Double rod — Double acting (W)

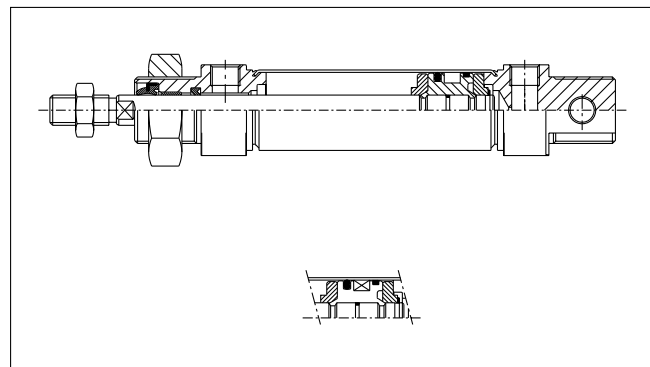
Dimensions unchanged

Specifications

| | |
|-------------------------|--------------------|
| Type | Air cylinder |
| Applicable size | ø32, ø40 mm |
| Max. operating pressure | 1 MPa (10 bar) |
| Min. operating pressure | 0.08 MPa (0.8 bar) |
| Cushion | Rubber bumper |
| Wiper ring | NBR (SCB) |

Note) Not applicable for non-rotating type.

Construction



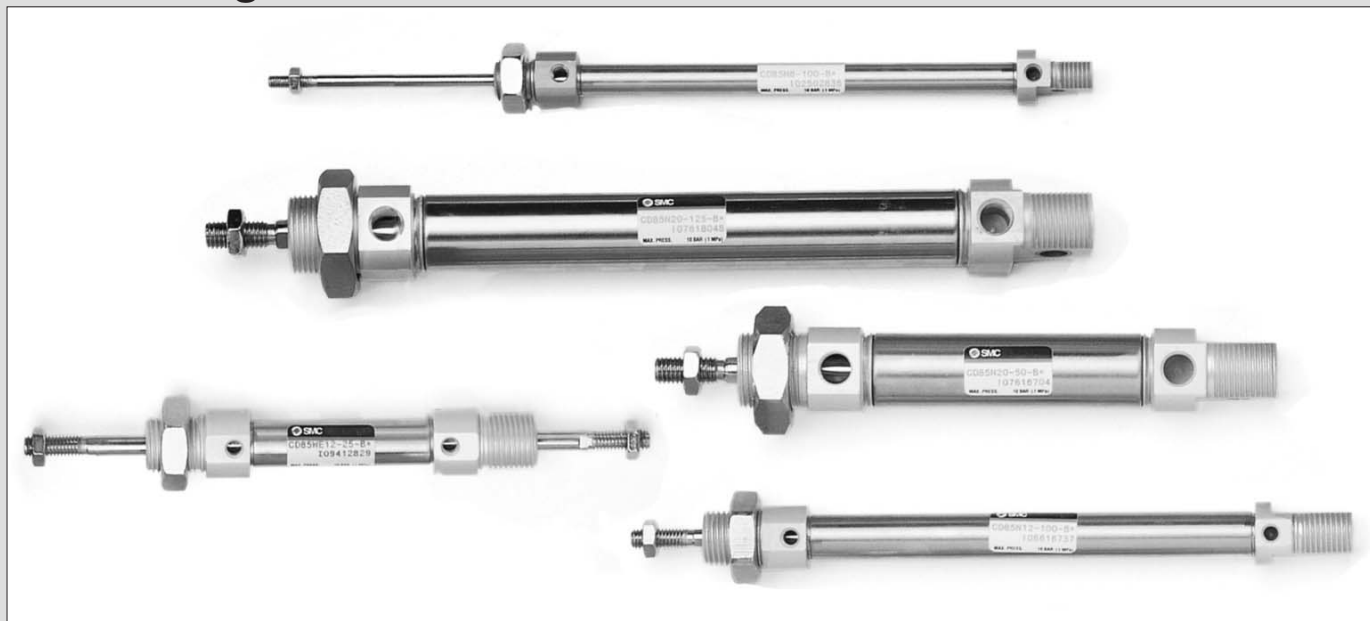


ISO Cylinder

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

Conforming to ISO 6432 and CETOP RP52P.

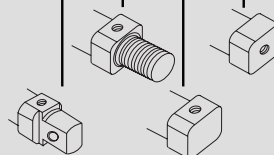


Series Variations

| Series | Action | Rod | Cushion | Head cover style | | | | Switch mount | | Rod boot (ø20, 25) | Bore size (mm) | Page |
|---|---------------|-----------------|---------|------------------|---|---|---|--------------|------|--------------------|----------------|---------|
| | | | | N | E | F | Y | Rail | Band | | | |
| Standard Series C85 | Double acting | Single | Rubber | ● | ● | ● | ● | ● | ● | ● | 8 to 25 | 6-11-6 |
| | | | Air | ● | ● | ● | ● | ● | ● | ● | 10 to 25 | |
| | | Double | Rubber | ● | ● | ● | ● | ● | ● | ● | 8 to 25 | |
| | | | Air | ● | ● | ● | ● | ● | ● | ● | 10 to 25 | |
| Non-rotating rod Series C85K | Single acting | Single (SR, SE) | Rubber | ● | ● | ● | ● | ● | ● | ● | 8 to 25 | 6-11-23 |
| | | | | (Not for SE) | | | | ● | ● | ● | 8 to 25 | |
| | | | | ● | ● | ● | ● | ● | ● | ● | 8 to 25 | |
| | | | | (Not for SE) | | | | ● | ● | ● | 8 to 25 | |
| Direct mount Series C85R | Base | Double acting | Single | Rubber | ● | ● | ● | ● | ● | ● | 8 to 25 | 6-11-38 |
| | | | | | ● | ● | ● | ● | ● | ● | 20, 25 | |
| | Front | Double acting | Single | Rubber | ● | ● | ● | ● | ● | ● | 8 to 25 | |
| | | | | | ● | ● | ● | ● | ● | ● | 20, 25 | |

Mounting style

SR = Spring Return
SE = Spring Extended



CJ1
CJP
CJ2
CM2
CG1
MB
MB1
CA2
CS1
C76
C85
C95
CP95
NCM
NCA
D-
-X
20-
Data

Series C85: $\varnothing 8$, $\varnothing 10$, $\varnothing 12$,

Extended Service Life

Automated assembly guarantees 100% repeatable mounting accuracy.

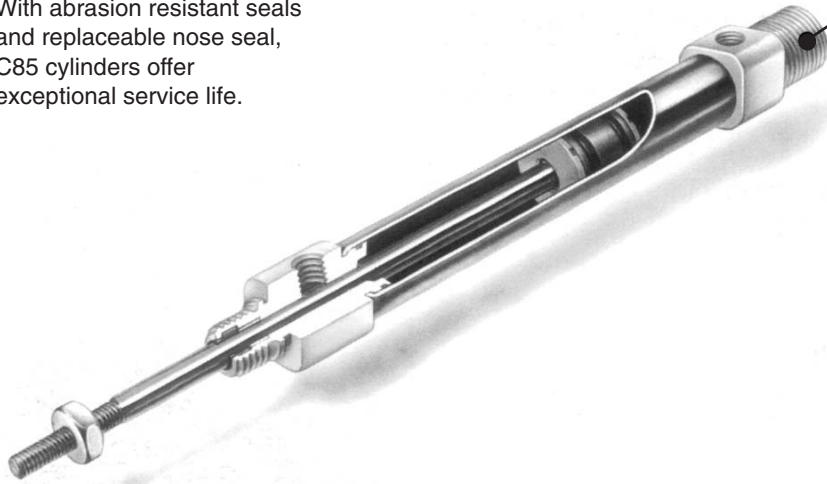
With abrasion resistant seals and replaceable nose seal, C85 cylinders offer exceptional service life.

Corrosion Resistance

All parts are corrosion resistant. End covers and clevis are specially anodised while barrel is stainless steel. Piston rod is stainless steel up to $\varnothing 16$. $\varnothing 20$ to $\varnothing 40$ is C45 hard chromed.

ISO Standard 6432

is compliant with auto switch type.



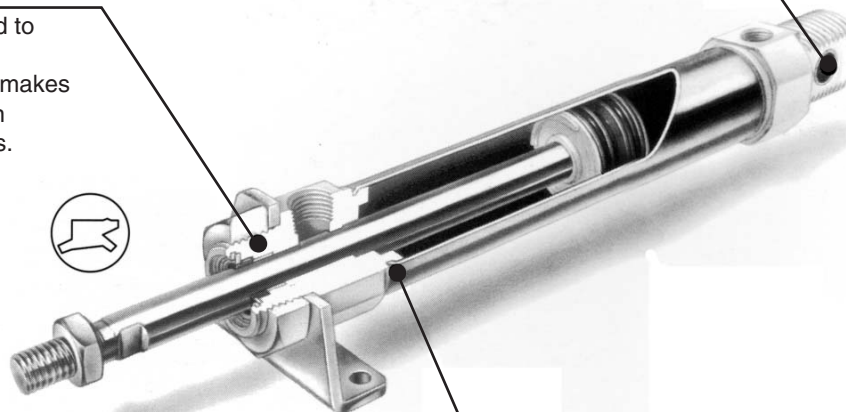
C85: $\varnothing 8$, $\varnothing 10$, $\varnothing 12$, $\varnothing 16$

Bronze Bush Bearing

High quality bronze bush in clevis bearing extends the life of cylinder.

High Dust Resistance

A unique rod seal is employed to prevent entry of dust. The effectiveness of the seal makes the cylinder suitable for use in extremely dusty environments.



C85: $\varnothing 20$, $\varnothing 25$

Leak Proof Assembly

Double swaging of the end covers of the barrel provides an absolutely air tight union.

ø16, ø20, ø25,

Easy-accurate Mounting

Simple space-saving design with high dimensional accuracy makes these cylinders very easy to use.
Large spanner flats on the rod and head covers greatly simplify their installation and positioning.

High Speed Actuation

Low friction and the standard elastomer cushion seals allow piston speeds up to 1500 mm/s. Either rubber bumper or air cushions are available.

Replaceable Rod Seal

Rod seal can be quickly replaced, greatly extending the cylinder life.
(C85 ø20, 25).

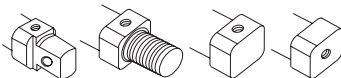
Minimized Side Clearance

The close tolerance of the piston rod in the front end bush allows greater side loading.

Strong, Corrosion-proof Barrel

The risk of breakage or deformation due to external impacts is reduced by the use of harder, heavy walled stainless steel tube.

C85: ø20, ø25



Mounting Flexibility
Different head covers allow a great variety of mounting options.

Series Variations

| Series | Action | Variations | Basic integrated clevis (N) | | | | | | Rod boot (Only ø20, ø25) | | | Only bores ø20, ø25 mm | | | | Bore ø8 to ø16 and all non-rotating piston rod are already Stainless steel | | | | |
|--------|---|--|-----------------------------|----|----|----|----|----|-----------------------------|---|--------------------------------|------------------------|------------------|------------------|-----------------------|--|----------------------|----------------------------------|---|----|
| | | | Bore size (mm) | | | | | | Double end (E) | | Front nose | | Auto switch | | -XB6 High temp. | -XB7 Low temp. | -XB9 Low speed | -XC4 Heavy duty scraper | R | R2 |
| | | | 8 | 10 | 12 | 16 | 20 | 25 | | | Front nose in line port (Y) | | Rail mounting | Band mounting | | | | | | |
| C85 | Double acting, Single rod | Rubber cushion | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| | | Air cushion | | • | • | • | • | • | • | | | • | • | • | | | | | • | • |
| | | Non rotating | • | • | • | • | • | • | • | • | • | • | • | | | | | | • | • |
| | | Direct mount Bottom side mounting | • | • | • | • | • | • | | • | • | • | • | | | | | | | • |
| | | Direct mount Front side mounting | | | | | • | • | | • | • | • | • | • | • | • | | | | • |
| | Double acting, Double rod | Rubber cushion | • | • | • | • | • | • | | • | | • | • | • | • | • | • | • | • | • |
| | | Air cushion | | • | • | • | • | • | | • | | • | • | • | | | | | • | • |
| | Single acting, Spring return | Rubber cushion | • | • | • | • | • | • | • | • | • | • | • | | | | | | • | • |
| | | Non rotating | • | • | • | • | • | • | • | • | • | • | • | | | | | | • | • |
| | Single acting, Spring extended | Rubber cushion | • | • | • | • | • | • | • | • | • | • | • | | | | | | • | • |
| | | Non rotating | • | • | • | • | • | • | • | • | • | • | • | | | | | | • | • |

Stainless steel piston rod and rod end nut
Stainless steel piston rod, rod end nut and mounting nut

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Stroke Selection

The relation between the cylinder size and the maximum stroke depending on the mounting style

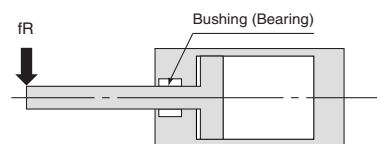
Assuming that the force that is generated by the cylinder itself acts as a buckling force on the piston rod or on the piston rod and the cylinder tube, the table below indicates in centimeters the maximum stroke that can be used, which was obtained through calculation. Therefore, it is possible to find the maximum stroke that can be used with each cylinder size according to the relationship between the level of the operating pressure and the type of cylinder mounting, regardless of the load factor.



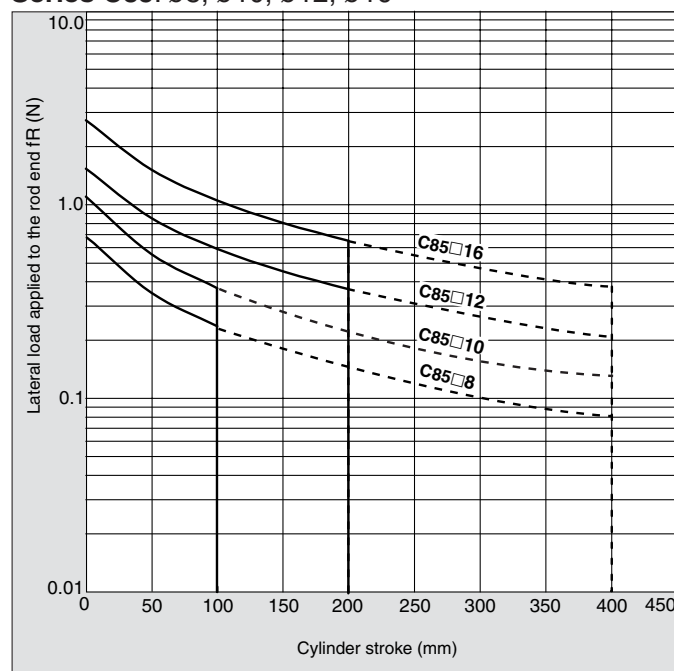
Reference: Even under a light load, if the piston rod has been stopped by an external stopper at the extending side of the cylinder, the maximum force generated by the cylinder will act upon the cylinder itself.

The maximum stroke at which the cylinder can be operated under a lateral load

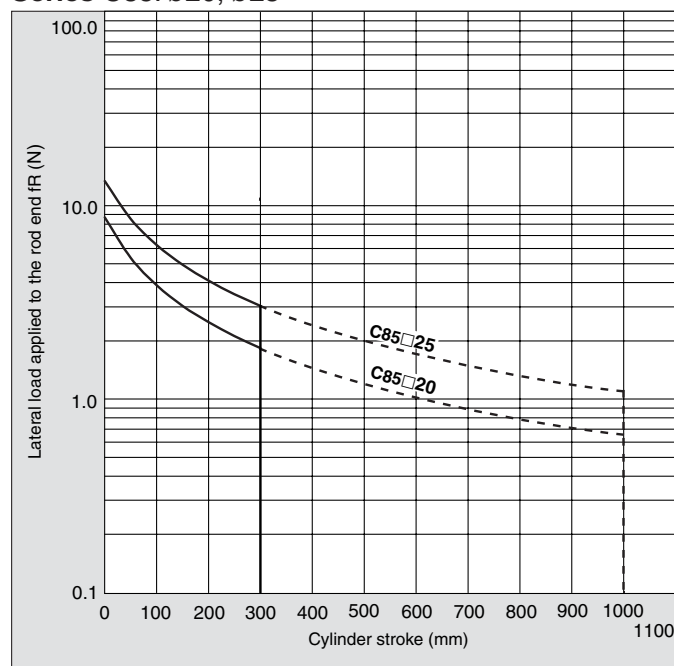
The region that does not exceed the bold solid line represents the allowable lateral load in relation to the cylinder of a given stroke length. In the graph, the range of the broken line shows that the long stroke limit has been exceeded. In this region, as a rule, operate the cylinder by providing a guide along the direction of movement.



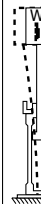
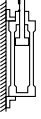









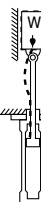
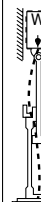

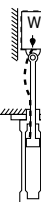
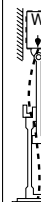


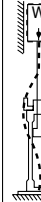


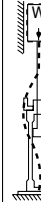


Series C85: $\phi 8$, $\phi 10$, $\phi 12$, $\phi 16$



Series C85: $\phi 20$, $\phi 25$



| Mounting style | | | Nominal symbol | Operating pressure (MPa) | Maximum stroke that can be used according to buckling strength | | | | | |
|---|---|---|--|-----------------------------|---|-------|-------|--------|--------|--------|
| Mounting bracket diagram | | | | | C85 | | | | | |
| | | | | | 8 | 10 | 12 | 16 | 20 | 25 |
| Foot: L | Rod side flange: F | Head side flange: G |  L F | 0.3 | 24 | 18 | 36 | 26 | 38 | 48 |
|  |  | 0.5 | | 18 | 14 | 27 | 19 | 29 | 36 | |
| | | 0.7 | | 14 | 11 | 22 | 16 | 23 | 30 | |
|  |  |  | G | 0.3 | 9 | 6 | 15 | 10 | 15 | 20 |
| | | | | 0.5 | 6 | 4 | 10 | 6 | 10 | 14 |
| | | | | 0.7 | 4 | 3 | 8 | 4 | 8 | 11 |
| Clevis: C, D | Rod side trunnion: U |  C D <td>0.3</td> <td>22</td> <td>17</td> <td>35</td> <td>24</td> <td>36</td> <td>46</td> | 0.3 | 22 | 17 | 35 | 24 | 36 | 46 | |
|  | 0.5 | | 16 | 12 | 26 | 18 | 27 | 34 | | |
| | 0.7 | | 13 | 10 | 21 | 14 | 22 | 28 | | |
| Head side trunnion: U | Center trunnion: O |  U <td>0.3</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>80</td> <td>(100)*</td> | 0.3 | (40)* | (40)* | (40)* | (40)* | 80 | (100)* | |
|  | Series CS1 only | | 0.5 | 38 | 30 | (40)* | (40)* | 61 | 77 | |
| | | | 0.7 | 32 | 25 | (40)* | 35 | 51 | 64 | |
|  |  | T | 0.3 | 22 | 17 | 35 | 24 | 37 | 47 | |
| | | | 0.5 | 16 | 12 | 26 | 18 | 27 | 35 | |
| | | | 0.7 | 13 | 10 | 21 | 14 | 22 | 28 | |
| Foot: L | Rod side flange: F | Head side flange: G |  L F <td>0.3</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>(100)*</td> <td>(100)*</td> | 0.3 | (40)* | (40)* | (40)* | (40)* | (100)* | (100)* |
|  |  | 0.5 | | (40)* | (40)* | (40)* | (40)* | 89 | (100)* | |
| | | 0.7 | | (40)* | 36 | (40)* | (40)* | 74 | 93 | |
|  |  |  | G | 0.3 | 33 | 26 | (40)* | 37 | 54 | 69 |
| | | | | 0.5 | 25 | 19 | 39 | 27 | 41 | 52 |
| | | | | 0.7 | 20 | 15 | 32 | 22 | 33 | 43 |
| Foot: L | Rod side flange: F | Head side flange: G |  L F <td>0.3</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>(40)*</td> <td>(100)*</td> <td>(100)*</td> | 0.3 | (40)* | (40)* | (40)* | (40)* | (100)* | (100)* |
|  |  | 0.5 | | (40)* | (40)* | (40)* | (40)* | (100)* | (100)* | |
| | | 0.7 | | (40)* | (40)* | (40)* | (40)* | (100)* | (100)* | |
|  |  |  | G | 0.3 | (40)* | 38 | (40)* | (40)* | 79 | (100)* |
| | | | | 0.5 | 37 | 29 | (40)* | (40)* | 60 | 76 |
| | | | | 0.7 | 30 | 23 | (40)* | 34 | 50 | 63 |

ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

How to Order

| | | |
|-------------------------------------|-----------------|---------------------------|
| Double acting Single rod | C D 85 | K N 16 40 C J A R2 |
| Double acting Double rod | C D 85 W | E 16 40 C JJ B |

Built-in magnet

| | |
|-----|-----------------|
| Nil | None |
| D | Built-in magnet |

Type

| | |
|-----|--|
| Nil | Standard |
| K | Non-rotating rod (Rubber cushion only) |

Mounting style

| Symbol | Mounting |
|--------|-------------------------|
| N | Basic integrated clevis |
| E** | Double end |
| F** | Front nose |
| Y** | Front nose in line port |

* Double acting, Double rod:
Only double end style (E).
** Except air cushion type.

Bore size

| Bore size (mm) | Standard stroke (mm)** | Max. stroke (mm) | | |
|----------------|--|------------------|--------------|------------|
| | | Standard | Non-rotating | Double rod |
| 8* | 10, 25, 40, 50, 80, 100 | 400 | 100 | 100 |
| 10 | | | | |
| 12 | | | | |
| 16 | 10, 25, 40, 50, 80, 100, 125, 160, 200 | 1000 | 1000 | 500 |
| 20 | | | | |
| 25 | | | | |

* Not available with air cushion.
** Other strokes available on request.

Stroke

Cushion

| | |
|-----|---|
| Nil | Rubber cushion (Standard) |
| C | Air cushion (Only "N" execution, bores 10 to 25 mm) |

Auto switch mounting type

| | |
|---|---------------|
| A | Rail mounting |
| B | Band mounting |

Applicable auto switches and bands are shown on page 6-11-44. Please order auto switches and bands separately.

Option

| | |
|----|--|
| R | Stainless steel piston rod, rod end nut and mounting nut |
| R2 | Stainless steel piston rod and rod end nut |

Note) Please refer to page 6-11-47 for additional options. Only one option can be selected.

Rod boot (Only ø20, ø25)

| | |
|-----|-------------------------------------|
| Nil | Without rod boot |
| J | Nylon tarpaulin one side |
| K | Heat resistant tarpaulin one side |
| JJ* | Nylon tarpaulin both sides |
| KK* | Heat resistant tarpaulin both sides |

* In the case of double acting/double rod.

Mounting Bracket Part No.

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|------------------|---------------------------------------|------------|------------|------------|-------------|----|----|
| Mounting bracket | Foot (1 pc.) | C85L10A | C85L16A | C85L25A | | | |
| | Foot (2 pcs. with mounting nut 1 pc.) | C85L10B | C85L16B | C85L25B | | | |
| | Flange | C85F10 | C85F16 | C85F25 | | | |
| | Trunnion | C85T10 | C85T16 | C85T25 | | | |
| | Clevis | C85C10 | C85C16 | C85C25 | | | |
| Accessory | Single knuckle joint | KJ4D | KJ6D | KJ8D | KJ10D | | |
| | Double knuckle joint | GKM4-8 | GKM6-10 | GKM8-16 | GKM10-20 | | |
| | Floating joint | JA10-4-070 | JA15-6-100 | JA20-8-125 | JA30-10-125 | | |

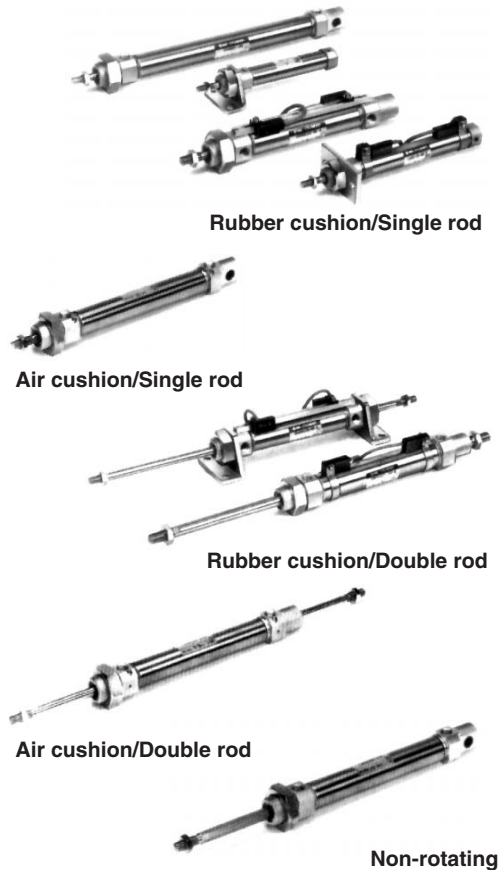
Replacement Parts For Standard Cylinders

| Bore size (mm) | Part no. | Note |
|----------------|----------|---|
| 20 | C85-20PS | Every set includes: n°1 rod seal |
| 25 | C85-25PS | n°1 seal retaining washer n°1 retaining ring |

For Non-rotating Cylinders ("K")

| Bore size (mm) | Part no. | Note |
|----------------|-----------|---|
| 20 | C85K-20PS | Every set includes: n°1 rod seal |
| 25 | C85K-25PS | n°1 seal retaining washer n°1 retaining ring |

ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**



Specifications

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|-------------------------------|--------------------------|--|----------|----------|----------|---------------------------------|------------|
| Piston rod dia. (mm) | | 4 | 4 | 6 | 6 | 8 | 10 |
| Piston rod thread | | M4 x 0.7 | M4 x 0.7 | M6 x 1 | M6 x 1 | M8 x 1.25 | M10 x 1.25 |
| Port size | | M5 x 0.8 | M5 x 0.8 | M5 x 0.8 | M5 x 0.8 | G 1/8 | G 1/8 |
| Action | | Double acting, Single/Double rod | | | | | |
| Fluid | | Air | | | | | |
| Proof pressure | | 1.5 MPa | | | | | |
| Max. operating pressure | | 1.0 MPa | | | | | |
| Min. operating pressure | Spring return | 0.1 MPa | 0.08 MPa | 0.05 MPa | 0.05 MPa | | |
| | Spring extended | | | | 0.08 MPa | | |
| Ambient and fluid temperature | | -20 to 80°C (Built-in magnet: -10 to 60°C) | | | | | |
| Cushion | | Rubber cushion, Air cushion (Except ø8) (Non-rotating: Rubber bumper only) | | | | | |
| Lubrication | | Not required. Use turbine oil Class 1 ISO VG32, if lubricated. | | | | | |
| Rod boot | Nylon tarpaulin | — | | | | Max. ambient temperature 60°C | |
| | Heat resistant tarpaulin | — | | | | Max. ambient temperature 110°C* | |
| Piston speed | | 50 to 1500 mm/s | | | | | |
| Allowable kinetic energy | Rubber cushion | 0.02 J | 0.03 J | 0.04 J | 0.09 J | 0.27J | 0.4 J |
| | Air cushion | — | 0.17 J | 0.19 J | 0.4 J | 0.66 J | 0.97 J |
| Non-rotating accuracy | | ±1° 30' | ±1° 30' | ± 1° | ±1° | ±0° 42' | ±0° 42' |
| Stroke tolerance (mm) | | 0/+1 | | | | 0/+1.4 | |

* Maximum ambient temperature of rod boots only.

JIS Symbol

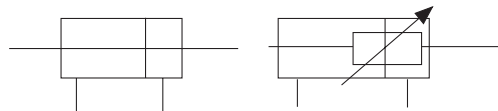
Double acting, Single rod



Rubber cushion

Air cushion

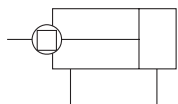
Double acting, Double rod



Rubber cushion

Air cushion

Non-rotating rod: Double acting, Single rod



Weight (Standard, Non-rotating rod)

(g)

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|------------------|---------------------------------------|---------|-----|-----|-----|----------|----------|
| Double action | Basic weight | 45 | 49 | 96 | 109 | 183(203) | 258(286) |
| | Add'l weight for each 10 mm of stroke | 3 | 3.2 | 6.2 | 7.2 | 11.8 | 18.4 |
| Mounting bracket | | C85L□A | 20 | 40 | 95 | | |
| | | C85L□B | 55 | 105 | 210 | | |
| | | C85F□ | 12 | 25 | 90 | | |
| | | C85T□ | 20 | 50 | 75 | | |
| | | C85C□ | 20 | 40 | 85 | | |
| Accessory | Single knuckle joint | KJID | 17 | 25 | 45 | 70 | |
| | Double knuckle joint | GKM□-□ | 10 | 20 | 50 | 100 | |
| | Floating joint | JA□-□-□ | 10 | 20 | 50 | 70 | |

Calculation: (Example) C85N10-50, C85F10

Basic weight ——— 49 (ø10)g

Additional weight ——— 3.2/10 mm of stroke

Cylinder stroke ——— 50 mm

Mounting bracket ——— 12g

49 + 3.2 x 50/10 = 65g 65 + 12 = 77g

() : In the case of air cushion

Series C85

Auto Switch Mounting, Minimum Possible Cylinder Stroke

Band Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|-----------------|-----------|-------|
| | 3 pcs. | | 2 pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 55 | 90 | 15 | 50 | 10 |
| D-C73C D-C80C D-H7C | 65 | 105 | 15 | 65 | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 60 | 105 | 15 | 60 | 10 |

Rail Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---------------------------------------|----------------------|--------|-------|
| | 3 pcs. | 2 pcs. | |
| | | | |
| D-A7□/A80 D-A73C/A80C | 35 | 10 | 5 |
| D-A7□H D-A80H | 45 | 10 | 5 |
| D-A79W * | 40 | 15 | 10 |
| D-F7□ D-J79 | 45 | 5 | 5 |
| D-F7□V D-J79C | 30 | 5 | 5 |
| D-F7□W D-J79W D-F7BAL D-F79F | 55 | 15 | 10 |
| D-F7□WV D-F7BAVL | 40 | 15 | 10 |

* "D-A79W" can not be mounted on bore size ø8, ø10, ø12 cylinder.

Band Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|---|------------------|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $50 + 45(n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $65 + 50(n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $60 + 55(n - 2)$ | 10 |

Rail Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---|----------------------|--|-------|
| | 2 pcs. | n pcs. | |
| | | | |
| D-A7□/A80 D-A7□H/A80H D-A73C/A80C D-F7□ D-F7□V D-J79 D-J79C | 10 | $10 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 5 |
| D-A79W D-F7□W D-J79W D-F7BAL D-F79F D-F7□WV D-F7BAVL | 15 | $15 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 10 |

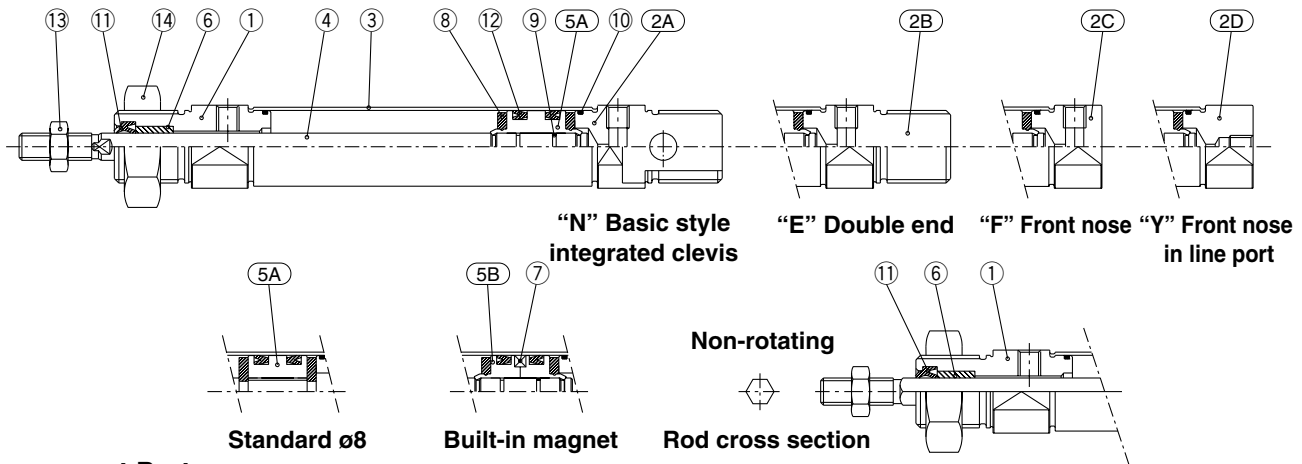
ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Rod Series C85

Construction

[First angle projection]

Double acting, Single rod

C□85□8 to 16 Rubber cushion (Disassembly is not possible.)

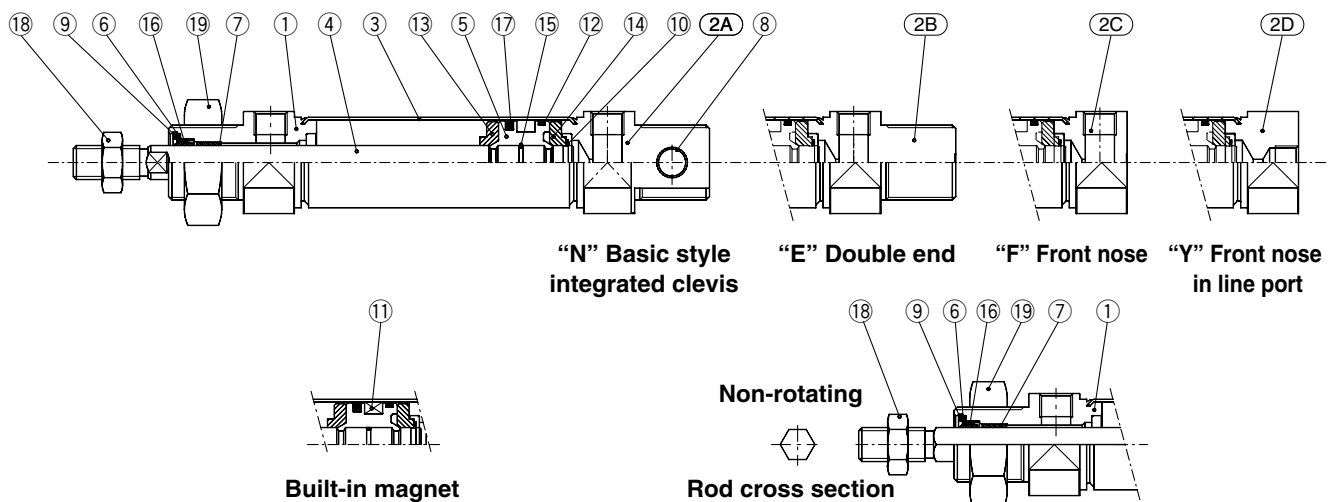


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|----------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover N | Aluminum alloy | 1 | White anodized |
| ②B | Head cover E | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Stainless steel | 1 | |
| ⑤A | Piston A | Brass | 1 | |
| ⑤B | Piston B | Brass | 2 | (Switch type piston) |

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|---------------------|
| ⑥ | Bush | Sintered bronze | 1 | |
| ⑦ | Magnet | Magnet | 1 | (Switch type only) |
| ⑧ | Bumper | Urethane | 2 | |
| ⑨ | Piston gasket | NBR | 1 | (2 for switch type) |
| ⑩ | Tube gasket | NBR | 2 | |
| ⑪ | Rod seal | NBR | 1 | |
| ⑫ | Piston seal | NBR | 2 | |
| ⑬ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑭ | Mounting nut | Carbon steel | 1 | Nickel plating |

C□85□20/25 Rubber cushion



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover N | Aluminum alloy | 1 | White anodized |
| ②B | Head cover E | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Bush | Sintered bronze | 2 | |

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ⑨ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑩ | Retaining ring | Stainless steel | 1 | |
| ⑪ | Magnet | Magnet | 1 | (Switch type only) |
| ⑫ | Wear ring | Resin | 1 | |
| ⑬ | Bumper A | Urethane | 1 | |
| ⑭ | Bumper B | Urethane | 1 | |
| ⑮ | Piston gasket | NBR | 1 | |
| ⑯ | Rod seal | NBR | 1 | |
| ⑰ | Piston seal | NBR | 1 | |
| ⑱ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑲ | Mounting nut | Carbon steel | 1 | Nickel plating |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

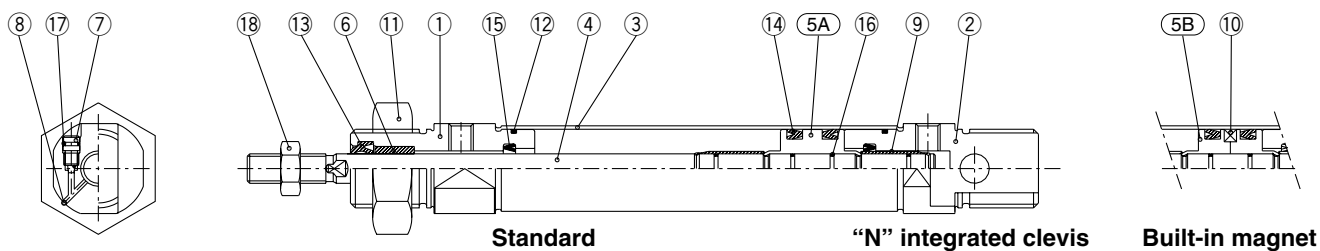
Series C85

Construction

[First angle projection]

Double acting, Single rod

C□85□10 to 16 Air cushion (Disassembly is not possible.)

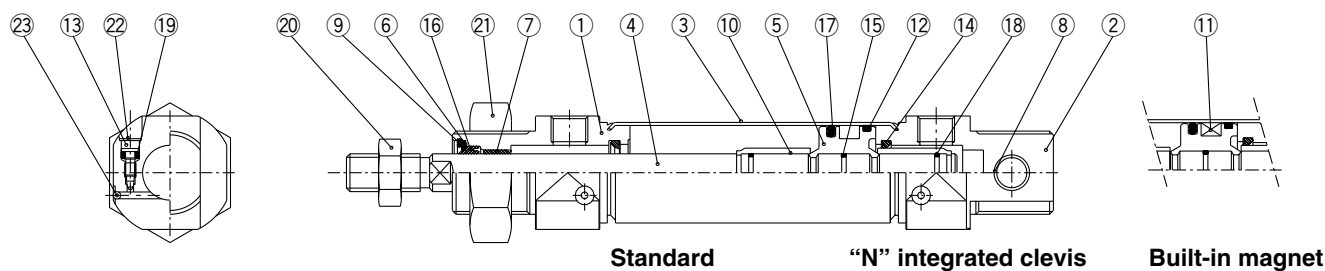


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|----------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ② | Head cover N | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Stainless steel | 1 | |
| ⑤A | Piston A | Brass | 1 | |
| ⑤B | Piston B | Brass | 2 | (Switch type piston) |
| ⑥ | Bush | Sintered bronze | 1 | |
| ⑦ | Cushion needle | Stainless steel | 2 | |
| ⑧ | Steel ball | Bearing steel | 2 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------------------------------|--------------|------|---------------------|
| ⑨ | Cushion ring | Brass | 2 | |
| ⑩ | Magnet | Magnet | 1 | (Switch type only) |
| ⑪ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑫ | Tube gasket | NBR | 2 | |
| ⑬ | Rod seal | NBR | 1 | |
| ⑭ | Piston seal | NBR | 2 | |
| ⑮ | Check seal | NBR | 2 | |
| ⑯ | Piston gasket and cushion ring gasket | NBR | 3 | (4 for switch type) |
| ⑰ | Needle seal | NBR | 2 | |
| ⑱ | Rod end nut | Carbon steel | 1 | Nickel plating |

C□85□20/25 Air cushion



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ② | Head cover N | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Bush | Sintered bronze | 1 | |
| ⑨ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑩ | Cushion ring | Brass | 2 | |
| ⑪ | Magnet | Magnet | 1 | (Switch type only) |
| ⑫ | Wear ring | Resin | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------------|-----------------|------|----------------------------|
| ⑬ | Cushion needle | Alloy steel | 2 | Electroless nickel plating |
| ⑭ | Cushion seal | Urethane | 2 | |
| ⑮ | Piston gasket | NBR | 1 | |
| ⑯ | Rod seal | NBR | 1 | |
| ⑰ | Piston seal | NBR | 1 | |
| ⑱ | Cushion ring gasket | NBR | 2 | |
| ⑲ | Cushion needle seal | NBR | 2 | |
| ⑳ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ㉒ | Self locking ring | Stainless steel | 2 | |
| ㉓ | Steel ball | Stainless steel | 2 | |

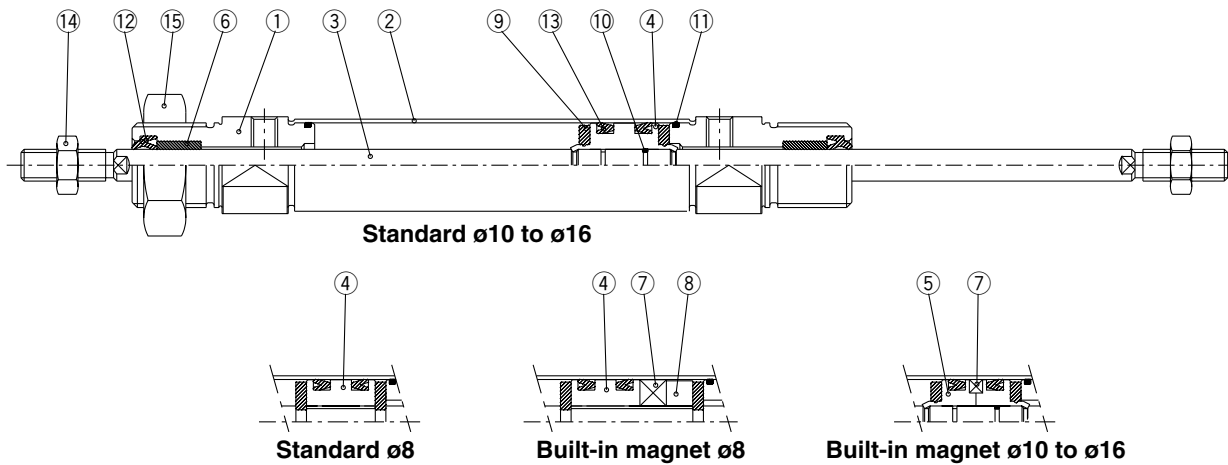
ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**

Construction

[First angle projection]

Double acting, Double rod

C□85WE8 to 16 Rubber cushion (Disassembly is not possible.)

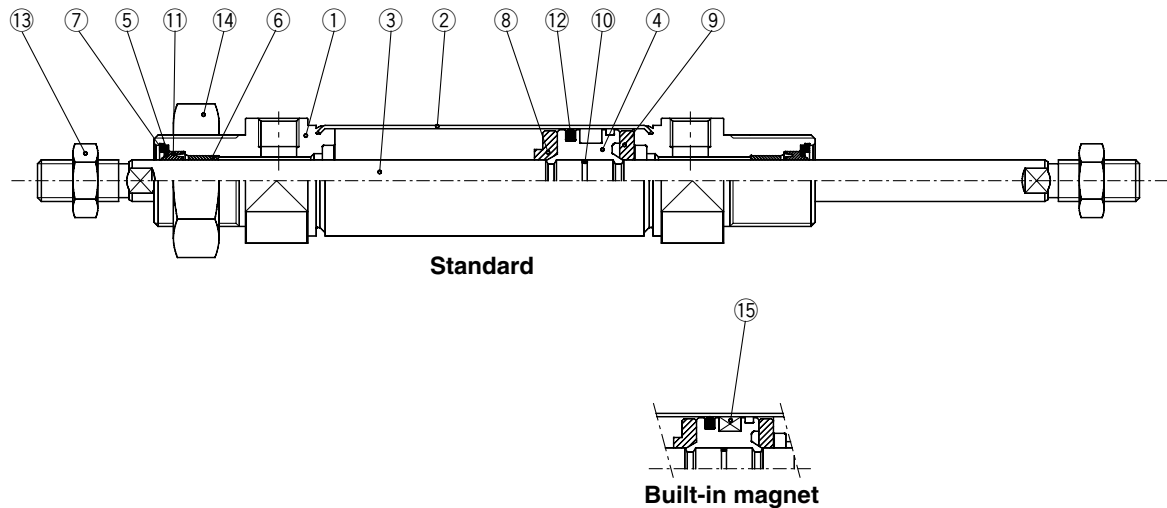


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|----------------------|
| ① | Rod cover | Aluminum alloy | 2 | White anodized |
| ② | Cylinder tube | Stainless steel | 1 | |
| ③ | Piston rod | Stainless steel | 1 | 2 for ø8 |
| ④ | Piston A | Brass | 1 | |
| ⑤ | Piston B | Brass | 2 | (Switch type piston) |
| ⑥ | Bush | Sintered bronze | 2 | |
| ⑦ | Magnet | Magnet | 1 | (Switch type only) |
| ⑧ | Spacer | Brass | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------|--------------|------|---------------------|
| ⑨ | Bumper | Urethane | 2 | |
| ⑩ | Piston gasket | NBR | 1 | (2 for switch type) |
| ⑪ | Tube gasket | NBR | 2 | |
| ⑫ | Rod seal | NBR | 2 | |
| ⑬ | Piston seal | NBR | 2 | |
| ⑭ | Rod end nut | Carbon steel | 2 | Nickel plating |
| ⑮ | Mounting nut | Carbon steel | 1 | Nickel plating |

C□85WE20/25 Rubber bumper



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 2 | White anodized |
| ② | Cylinder tube | Stainless steel | 1 | |
| ③ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ④ | Piston | Aluminum alloy | 1 | Chromate |
| ⑤ | Plain washer | Stainless steel | 2 | |
| ⑥ | Bush | Sintered bronze | 2 | |
| ⑦ | Retaining ring | Carbon steel | 2 | Nickel plating |
| ⑧ | Bumper A | Urethane | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|---------------|--------------|------|--------------------|
| ⑨ | Bumper B | Urethane | 1 | |
| ⑩ | Piston gasket | NBR | 1 | |
| ⑪ | Rod seal | NBR | 2 | |
| ⑫ | Piston seal | NBR | 1 | |
| ⑬ | Rod end nut | Carbon steel | 2 | Nickel plating |
| ⑭ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑮ | Magnet | Magnet | 1 | (Switch type only) |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

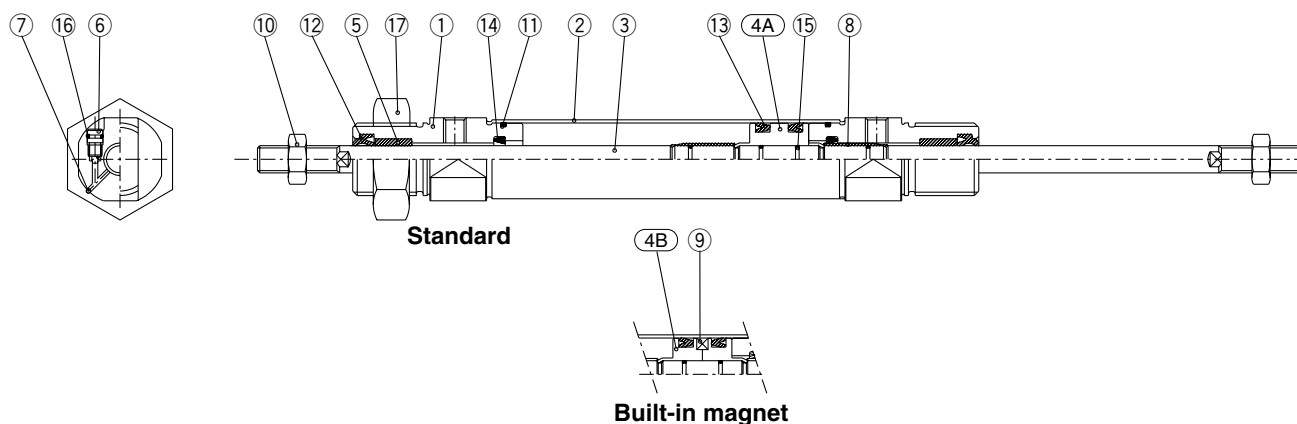
Series C85

Construction

[First angle projection]

Double acting, Double rod

C□85WE10 to 16 Air cushion (Disassembly is not possible.)

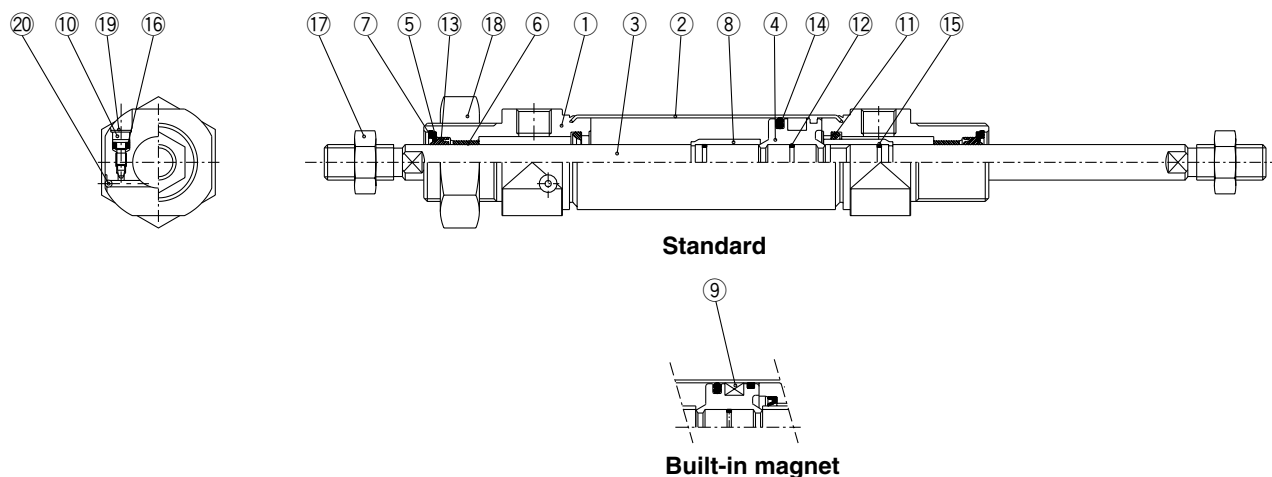


Component Parts

| No. | Discription | Material | Qty. | Note |
|-----|----------------|-----------------|------|----------------------|
| ① | Rod cover | Aluminum alloy | 2 | White anodized |
| ② | Cylinder tube | Stainless steel | 1 | |
| ③ | Piston rod | Stainless steel | 1 | |
| ④A | Piston A | Brass | 1 | |
| ④B | Piston B | Brass | 2 | (Switch type piston) |
| ⑤ | Bush | Sintered bronze | 2 | |
| ⑥ | Cushion needle | Stainless steel | 2 | |
| ⑦ | Steel ball | Bearing steel | 2 | |
| ⑧ | Cushion ring | Brass | 2 | |

| No. | Discription | Material | Qty. | Note |
|-----|---------------------------------------|--------------|------|---------------------|
| ⑨ | Magnet | Magnet | 1 | (Switch type only) |
| ⑩ | Rod end nut | Carbon steel | 2 | Nickel plating |
| ⑪ | Tube gasket | NBR | 2 | |
| ⑫ | Rod seal | NBR | 2 | |
| ⑬ | Piston seal | NBR | 2 | |
| ⑭ | Check seal | NBR | 2 | |
| ⑮ | Piston gasket and cushion ring gasket | NBR | 3 | (4 for switch type) |
| ⑯ | Needle seal | NBR | 2 | |
| ⑰ | Mounting nut | Carbon steel | 2 | Nickel plating |

C□85WE 20/25 Air cushion



Component Parts

| No. | Discription | Material | Qty. | Note |
|-----|----------------|-----------------|------|----------------------------|
| ① | Rod cover | Aluminum alloy | 2 | White anodized |
| ② | Cylinder tube | Stainless steel | 1 | |
| ③ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ④ | Piston | Aluminum alloy | 1 | Chromated |
| ⑤ | Plain washer | Stainless steel | 2 | |
| ⑥ | Bush | Sintered bronze | 2 | |
| ⑦ | Retaining ring | Carbon steel | 2 | Nickel plating |
| ⑧ | Cushion ring | Brass | 2 | |
| ⑨ | Magnet | Magnet | 1 | (Switch type only) |
| ⑩ | Cushion needle | Alloy steel | 2 | Electroless nickel plating |

| No. | Discription | Material | Qty. | Note |
|-----|---------------------|-----------------|------|----------------|
| ⑪ | Cushion seal | Urethane | 2 | |
| ⑫ | Piston gasket | NBR | 1 | |
| ⑬ | Rod seal | NBR | 2 | |
| ⑭ | Piston seal | NBR | 1 | |
| ⑮ | Cushion ring gasket | NBR | 2 | |
| ⑯ | Cushion needle seal | NBR | 2 | |
| ⑰ | Rod end nut | Carbon steel | 2 | Nickel plating |
| ⑱ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ⑲ | Self locking ring | Stainless steel | 2 | |
| ⑳ | Steel ball | Stainless steel | 2 | |

ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**

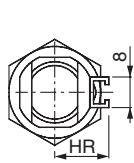
Dimensions

[First angle projection]

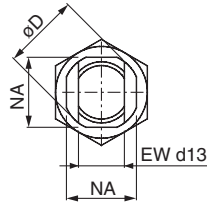
Double acting, Single rod

Rubber cushion: C□85N **Bore** **Stroke** □

Without magnet, Built-in magnet



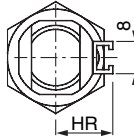
Rail mounting type (A)



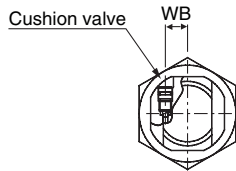
Band mounting type (B)
or non-magnet

Air cushion: C□85N **Bore** **Stroke** C-□

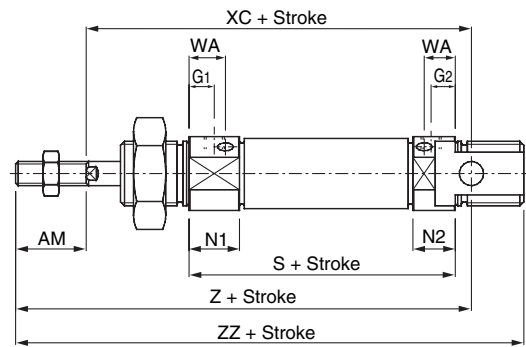
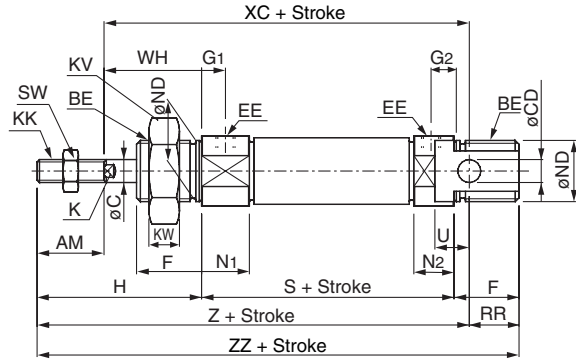
Without magnet, Built-in magnet



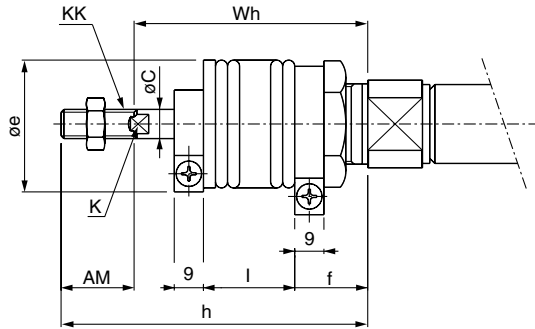
Rail mounting type (A)



Band mounting type (B)
or non-magnet

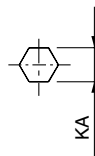


With rod boot

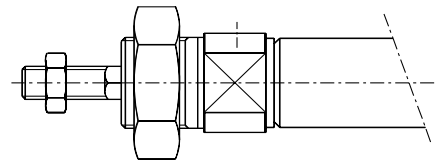


C□85KN

Non-rotating, Piston rod (Rubber cushion only)



Rod cross section



| Bore | AM | BE | oC | oCD H9 | oD | EE | EW | F | G1 | G2 | WA | WB | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | oND h8 | RR | S | SW | U | WH | XC | Z | ZZ |
|------|----|------------|----|--------|------|----------|----|----|---------|---------|-----------|------|----|------|---|------|------------|----|----|-------------|-------------|------|--------|----|---------|----|----|----|---------|---------|-----------|
| 8 | 12 | M12 x 1.25 | 4 | 4H9 | 16.7 | M5 x 0.8 | 8 | 12 | 7 | 5 | — | — | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 10 | 46 | 7 | 6 | 16 | 64 | 76 | 86 |
| 10 | 12 | M12 x 1.25 | 4 | 4H9 | 16.7 | M5 x 0.8 | 8 | 12 | 7 (5.5) | 5 (5.5) | 10.5 | 4.5 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 (13.5) | 9.5 (13.5) | 15 | 12 | 10 | 46 (53) | 7 | 6 | 16 | 64 (71) | 76 (83) | 86 (93) |
| 12 | 16 | M16 x 1.5 | 6 | 6H9 | 19.7 | M5 x 0.8 | 12 | 17 | 8 (5.5) | 6 (5.5) | 9.5 | 5.5 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 (12.5) | 10.5 (12.5) | 18.3 | 16 | 14 | 50 (54) | 10 | 9 | 22 | 75 (79) | 91 (95) | 105 (109) |
| 16 | 16 | M16 x 1.5 | 6 | 6H9 | 19.7 | M5 x 0.8 | 12 | 17 | 8 (5.5) | 6 (5.5) | 9.5 | 5.5 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 (12.5) | 10.5 (12.5) | 18.3 | 16 | 13 | 56 (56) | 10 | 9 | 22 | 82 (82) | 98 (98) | 111 (111) |
| 20 | 20 | M22 x 1.5 | 8 | 8 | 28 | G 1/8 | 16 | 20 | 8 | 8 | 11.5 (13) | 8.5 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 (17) | 15 (17) | 24 | 22 | 11 | 62 | 13 | 12 | 24 | 95 | 115 | 126 |
| 25 | 22 | M22 x 1.5 | 10 | 8 | 33.5 | G 1/8 | 16 | 22 | 8 | 8 | 11.5 (13) | 10.5 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 (17) | 15 (17) | 30 | 22 | 11 | 65 | 17 | 12 | 28 | 104 | 126 | 137 |

(): In the case of air cushion.

With Rod Boot

| Item | AM | oC | oD | f | K | KK | h | | | | | | |
|------|--------|----|----|----|---|------------|---------|-----------|------------|------------|------------|------------|------------|
| Bore | Stroke | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 20 | 8 | 36 | 20 | 6 | M8 x 1.25 | 71 | 84 | 96 | 109 | 134 | 159 | — |
| 25 | 22 | 10 | 36 | 20 | 8 | M10 x 1.25 | 74 | 87 | 99 | 112 | 137 | 162 | 187 |

| Bore | Item | I | | | | | | | Wh | | | | | | |
|------|--------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | Stroke | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| | 20 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | — | 51 | 64 | 76 | 89 | 114 | 139 | — |
| | 25 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

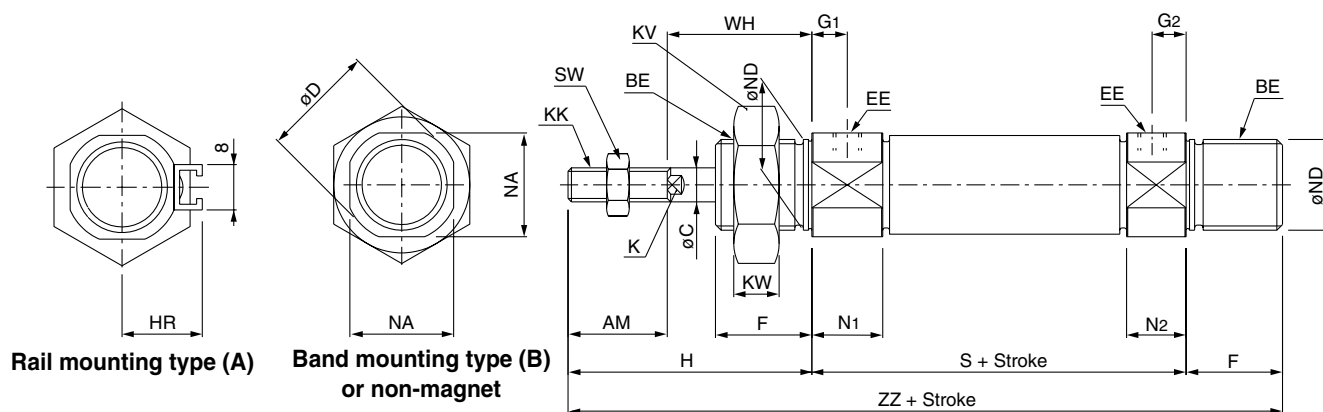
Dimensions

[First angle projection]

Double acting, Single rod

Rubber cushion: C□85E Bore—Stroke—□

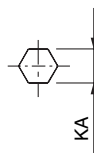
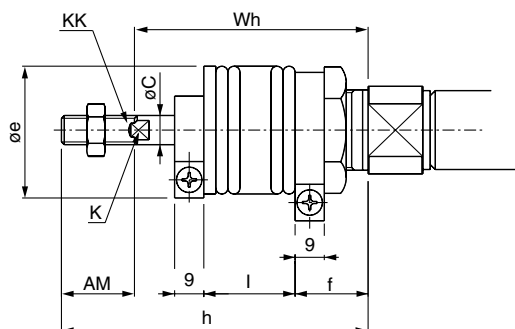
Without magnet, Built-in magnet



C□85KE

Non-rotating, Piston rod (Rubber cushion only)

With rod boot



Rod cross section

| | | | | | | | | | | | | | | | | | | | | | | | (mm) |
|------|----|------------|----|------|----------|----|----|----|----|------|---|------|------------|----|----|------|------|------|--------|----|----|----|------|
| Bore | AM | BE | øC | øD | EE | F | G1 | G2 | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | øND h8 | S | SW | WH | ZZ |
| 8 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 5 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 46 | 7 | 16 | 86 |
| 10 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 5 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 46 | 7 | 16 | 86 |
| 12 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 50 | 10 | 22 | 105 |
| 16 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 56 | 10 | 22 | 111 |
| 20 | 20 | M22 x 1.5 | 8 | 28 | G 1/8 | 20 | 8 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 22 | 62 | 13 | 24 | 126 |
| 25 | 22 | M22 x 1.5 | 10 | 33.5 | G 1/8 | 22 | 8 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 22 | 65 | 17 | 28 | 137 |

With Rod Boot

(mm)

| Bore | Item Stroke | AM | øC | øe | f | K | KK | h | | | | | | |
|------|----------------|----|----|----|----|---|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 20 | 20 | 8 | 36 | 20 | 6 | M8 x 1.25 | 71 | 84 | 96 | 109 | 134 | 159 | — |
| 25 | 22 | 22 | 10 | 36 | 20 | 8 | M10 x 1.25 | 74 | 87 | 99 | 112 | 137 | 162 | 187 |

| Bore | Item Stroke | I | | | | | | | Wh | | | | | | |
|------|----------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 20 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | — | 51 | 64 | 76 | 89 | 114 | 139 | — |
| 25 | 22 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 |

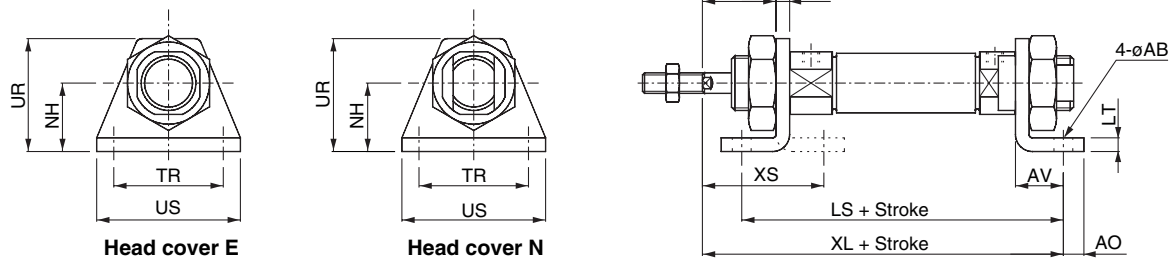
ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**

Dimensions with Mounting Bracket

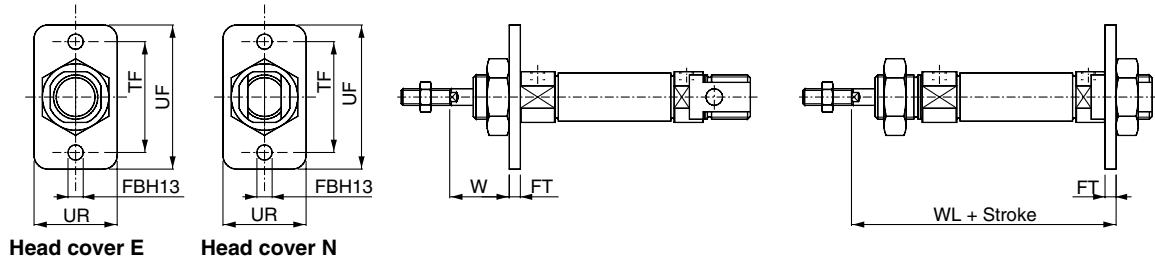
[First angle projection]

Double acting, Single rod

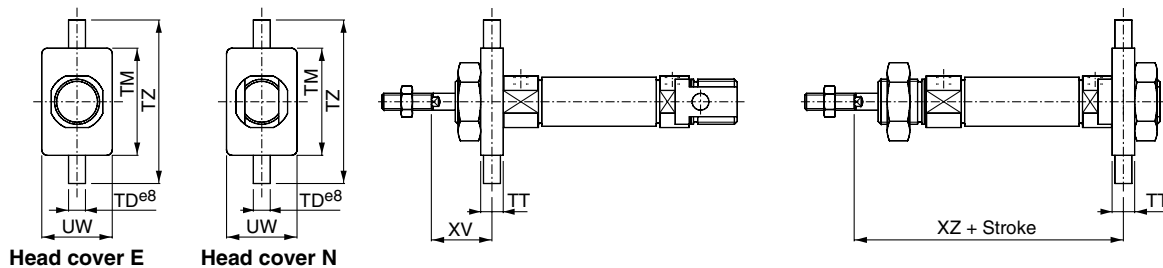
Rod foot, Rod and head foot: C85L10^A_B, C85L16^A_B, C85L25^A_B



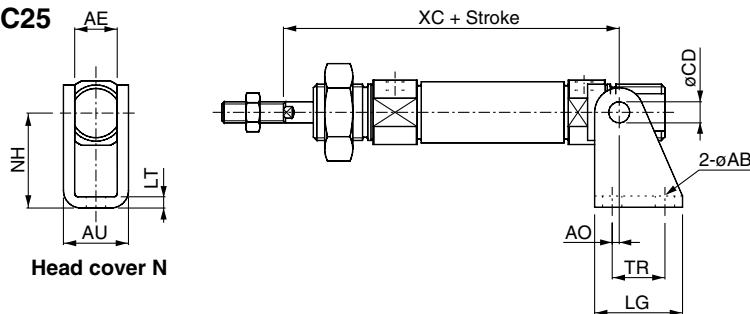
Rod flange, Head flange: C85F10, C85F16, C85F25



Rod trunnion, Head trunnion: C85T10, C85T16, C85T25



Clevis: C85C10, C85C16, C85C25



| Bore | Rod foot, Rod and head foot | | | | | | | | | | | | Rod flange, Head flange | | | | | | |
|------|-----------------------------|----|-----|-----|----|--------|--------|---------|------|----|----|------|-------------------------|-------|-----|----|----|------|------------|
| | AO | US | øAB | LT | NH | LS | XL | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | WL |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 68 | 73 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 65.2 |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 68(75) | 73(80) | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 65.2(72.2) |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 78(82) | 86(90) | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 76(80) |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 84(84) | 92(92) | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 82(82) |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 96 | 103 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 91 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 99 | 110 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 98 |

| Bore | Rod trunnion, Head trunnion | | | | | | | Clevis | | | | | | | | | |
|------|-----------------------------|----|--------|----|----|----|--------|--------|------|-----|-----|------|------|----|----|-----|--------|
| | TT | UW | øTD ø8 | TM | TZ | XV | XZ | øCD H9 | AE | øAB | AO | AU | TR | LG | NH | LT | XC |
| 8 | 6 | 20 | 4 | 26 | 38 | 13 | 65 | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 64 |
| 10 | 6 | 20 | 4 | 26 | 38 | 13 | 65(72) | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 64(71) |
| 12 | 8 | 25 | 6 | 38 | 58 | 18 | 76(80) | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 75(79) |
| 16 | 8 | 25 | 6 | 38 | 58 | 18 | 82(82) | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 82(82) |
| 20 | 8 | 32 | 6 | 46 | 66 | 20 | 90 | 8 | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 95 |
| 25 | 8 | 32 | 6 | 46 | 66 | 24 | 97 | | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 104 |

(): In the case of air cushion.

Series C85

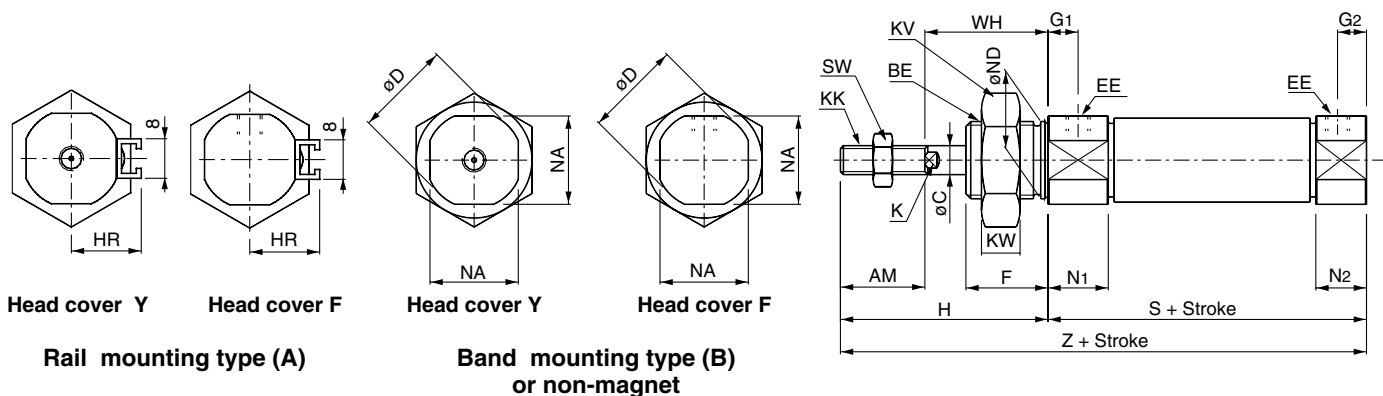
Dimensions

[First angle projection]

Double acting, Single rod

Rubber cushion: C 85F/Y Bore Stroke

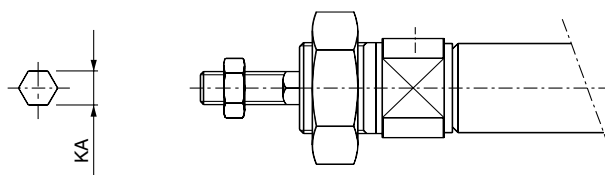
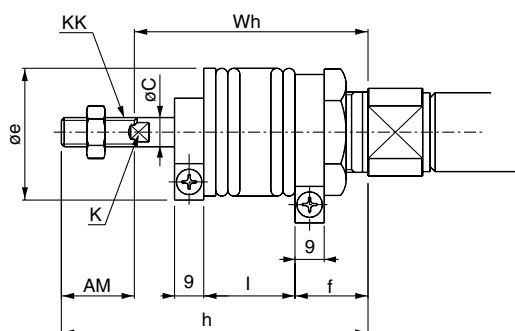
Without magnet, Built-in magnet



With rod boot

C□85KF/Y Bore—Stroke

Non-rotating, Piston rod (Rubber cushion only)



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | EE | F | G1 | G2 | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | øND h8 | S | SW | WH | Z |
|------|----|------------|----|------|----------|----|----|----|----|------|---|------|------------|----|----|------|------|------|--------|----|----|----|-----|
| 8 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 5 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 46 | 7 | 16 | 74 |
| 10 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 5 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 46 | 7 | 16 | 74 |
| 12 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 50 | 10 | 22 | 88 |
| 16 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 50 | 10 | 22 | 88 |
| 20 | 20 | M22 x 1.5 | 8 | 28 | G 1/8 | 20 | 8 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 22 | 62 | 13 | 24 | 106 |
| 25 | 22 | M22 x 1.5 | 10 | 33.5 | G 1/8 | 22 | 8 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 22 | 65 | 17 | 28 | 115 |

With Rod Boot

(mm)

| Bore \ Item Stroke | AM | øC | øe | f | K | KK | h | | | | | | |
|-----------------------|----|----|----|----|---|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 20 | 8 | 36 | 20 | 6 | M8 x 1.25 | 71 | 84 | 96 | 109 | 134 | 159 | — |
| 25 | 22 | 10 | 36 | 20 | 8 | M10 x 1.25 | 74 | 87 | 99 | 112 | 137 | 162 | 187 |

| Bore | Item Stroke | I | | | | | | | Wh | | | | | | |
|-----------|----------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | — | 51 | 64 | 76 | 89 | 114 | 139 | — |
| 25 | | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 |

ISO Cylinder: Standard/Non-rotating Type

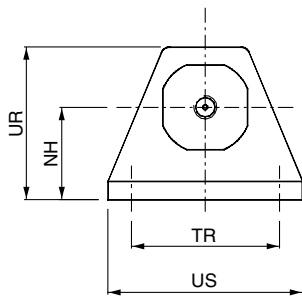
Double Acting, Single/Double Rod **Series C85**

Dimensions with Mounting Bracket

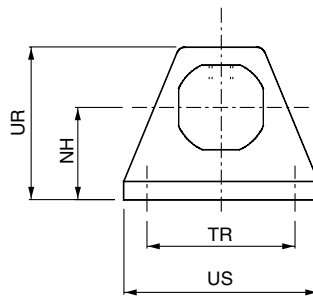
[First angle projection]

Double acting, Single rod

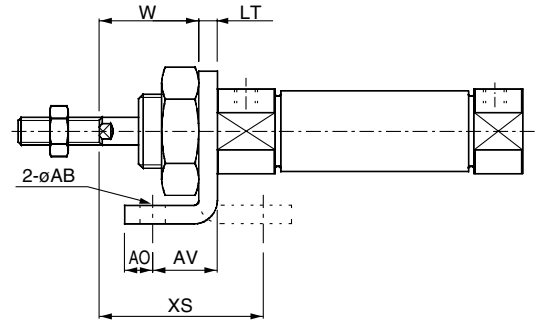
Rod foot: C85L10A, C85L16A, C85L25A



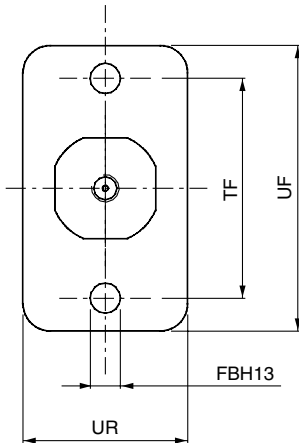
Head cover Y



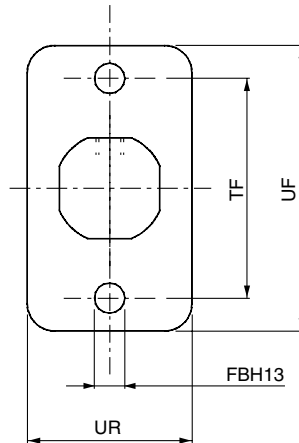
Head cover F



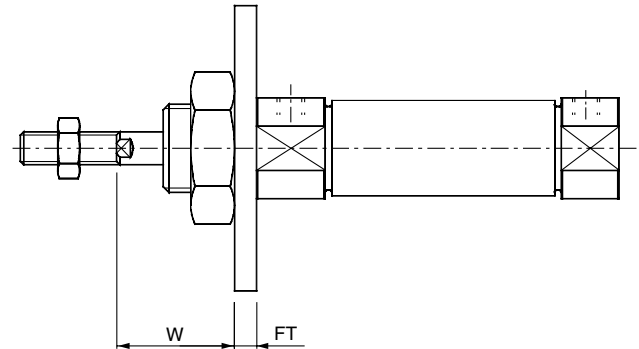
Rod flange: C85F10, C85F16, C85F25



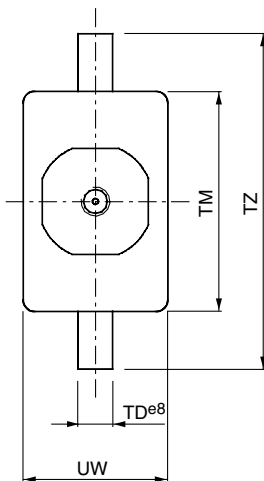
Head cover Y



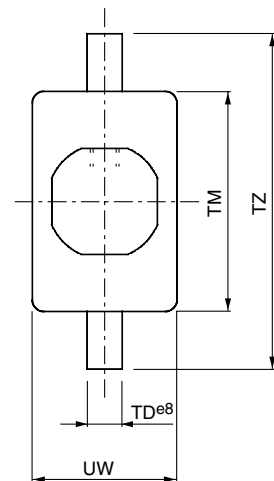
Head cover F



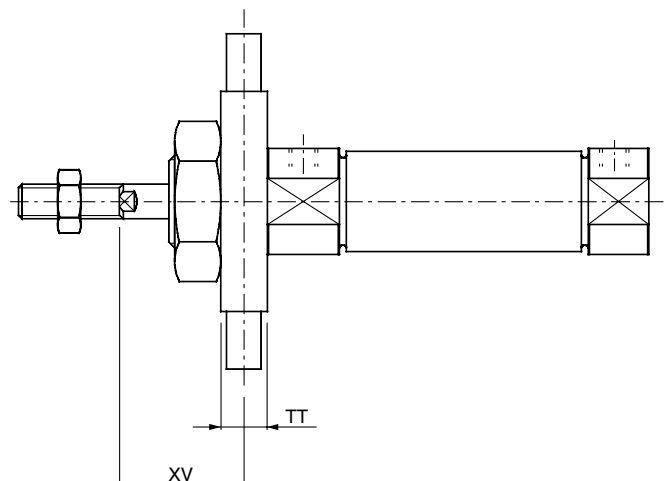
Rod trunnion: C85T10, C85T16, C85T25



Head cover Y



Head cover F



| (mm) | | | | | | | | | | | | | | | | | | | | | | |
|------|----------|----|-----|-----|----|---------|------|----|----|------|------------|-------|-----|----|----|------|--------------|----|-------|----|----|----|
| Bore | Rod foot | | | | | | | | | | Rod flange | | | | | | Rod trunnion | | | | | |
| | AO | US | øAB | LT | NH | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | TT | UW | TD e8 | TM | TZ | XV |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 8 | 32 | 6 | 46 | 66 | 20 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 8 | 32 | 6 | 46 | 66 | 24 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

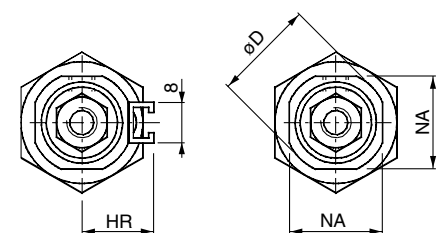
Dimensions

[First angle projection]

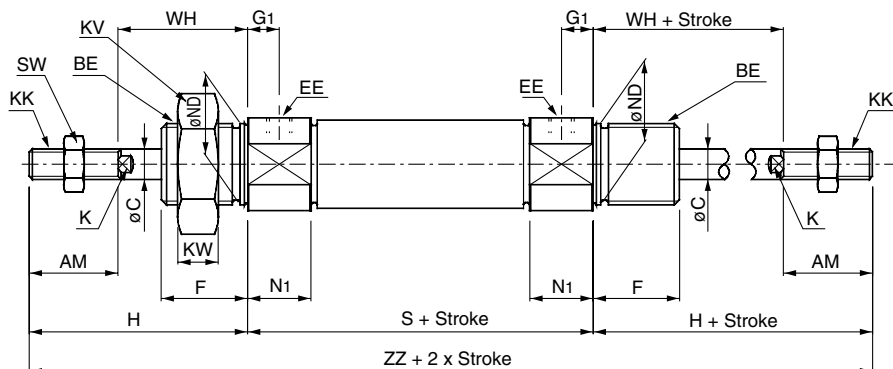
Double acting, Double rod

Rubber cushion: C□85WE Bore — Stroke □

Without magnet, Built-in magnet

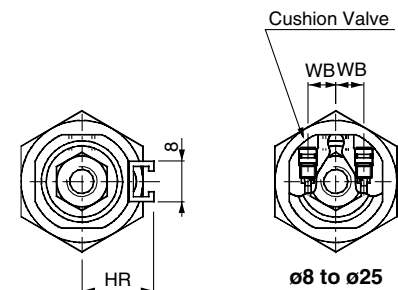


Rail mounting type (A) Band mounting type (B) or non-magnet

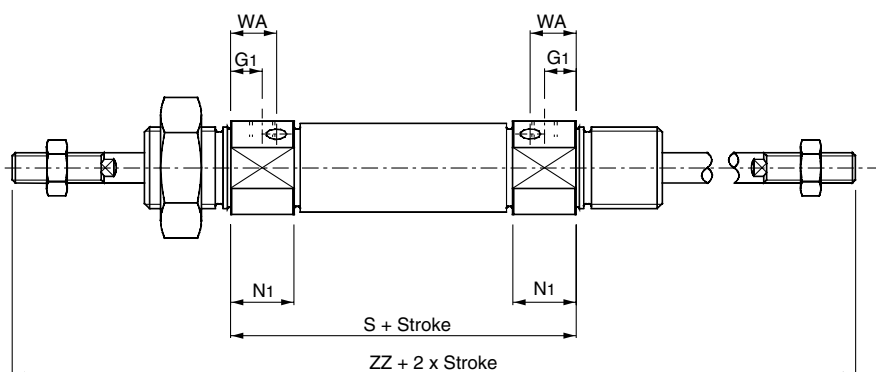


Air Cushion: C□85WE Bore — Stroke C—□

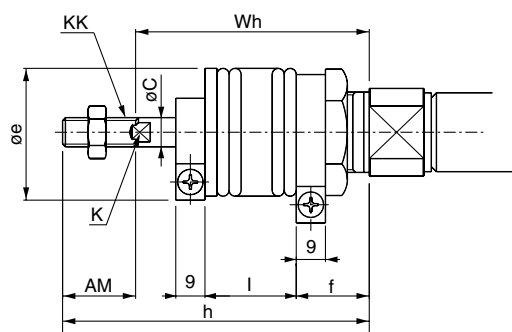
Without magnet, Built-in magnet



Rail mounting type (A) Band mounting type (B) or non-magnet



With rod boot



(mm)

| Bore | AM | BE | øC | øD | EE | F | G1 | WA | WB | H | HR | K | KK | KV | KW | N1 | NA | øND h8 | S | SW | WH | ZZ |
|------|----|------------|----|------|----------|----|--------|----------|------|----|------|---|------------|----|----|------------|------|--------|--------|----|----|----------|
| 8 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | — | — | 28 | 10 | — | M4 x 0.7 | 19 | 6 | 11.5 | 15 | 12 | 48(54) | 7 | 16 | 104(110) |
| 10 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7(5.5) | 10.5 | 4.5 | 28 | 10.5 | — | M4 x 0.7 | 19 | 6 | 11.5(13.5) | 15 | 12 | 48(53) | 7 | 16 | 104(109) |
| 12 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8(5.5) | 9.5 | 5.5 | 38 | 14 | 5 | M6 x 1 | 24 | 8 | 12.5(12.5) | 18.3 | 16 | 52(54) | 10 | 22 | 128(130) |
| 16 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8(5.5) | 9.5 | 5.5 | 38 | 14 | 5 | M6 x 1 | 24 | 8 | 12.5(12.5) | 18.3 | 16 | 52(54) | 10 | 22 | 128(130) |
| 20 | 20 | M22 x 1.5 | 8 | 28 | G 1/8 | 20 | 8 | 11.5(13) | 8.5 | 44 | 17 | 6 | M8 x 1.25 | 32 | 11 | 15(17) | 24 | 22 | 62 | 13 | 24 | 150 |
| 25 | 22 | M22 x 1.5 | 10 | 33.5 | G 1/8 | 22 | 8 | 11.5(13) | 10.5 | 50 | 20 | 8 | M10 x 1.25 | 32 | 11 | 15(17) | 30 | 22 | 65 | 17 | 28 | 165 |

() : In the case of air cushion. { } : In the case of built-in magnet

With Rod Boot

(mm)

| Item Bore Stroke | AM | øC | øe | f | K | KK | h | | | | | | |
|------------------------|----|----|----|----|---|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 20 | 8 | 36 | 20 | 6 | M8 x 1.25 | 71 | 84 | 96 | 109 | 134 | 159 | — |
| 25 | 22 | 10 | 36 | 20 | 8 | M10 x 1.25 | 74 | 87 | 99 | 112 | 137 | 162 | 187 |

| Item Bore Stroke | I | | | | | | | Wh | | | | | | |
|------------------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1 to 50 | 50 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 ~ 150 | 151 ~ 200 | 201 ~ 300 | 301 ~ 400 | 401 ~ 500 |
| 20 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | — | 51 | 64 | 76 | 89 | 114 | 139 | — |
| 25 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 |

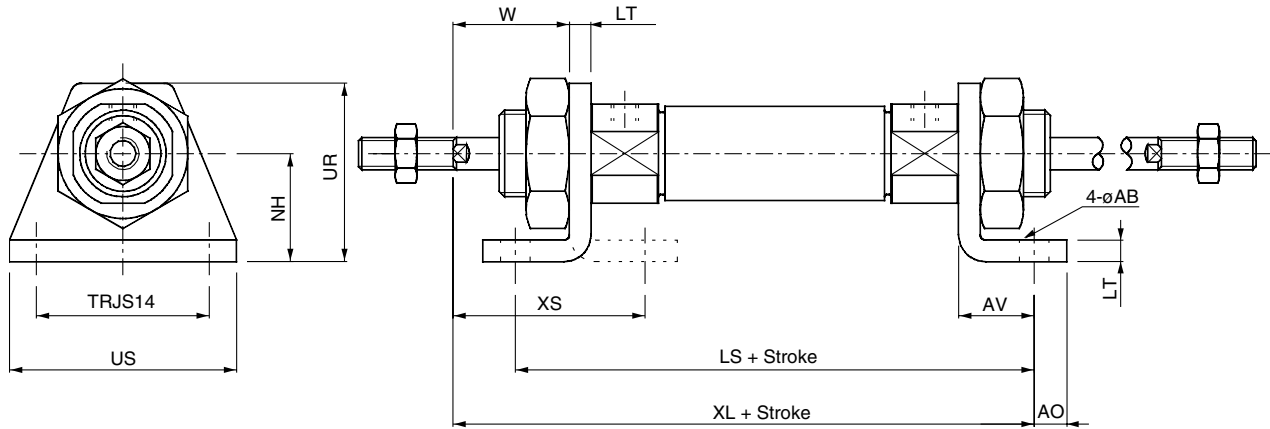
ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**

Dimensions with Mounting Bracket

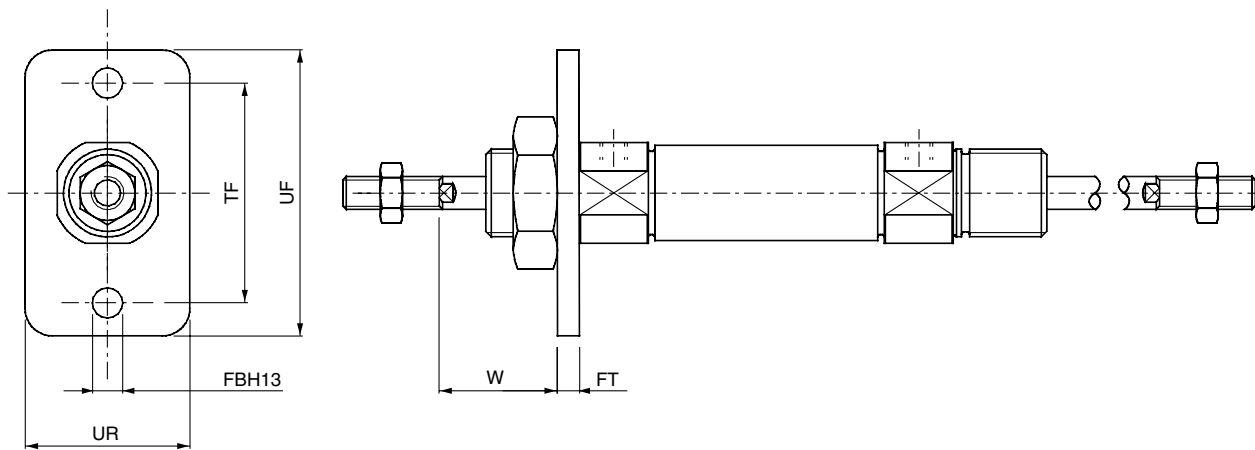
[First angle projection]

Double acting, Double rod

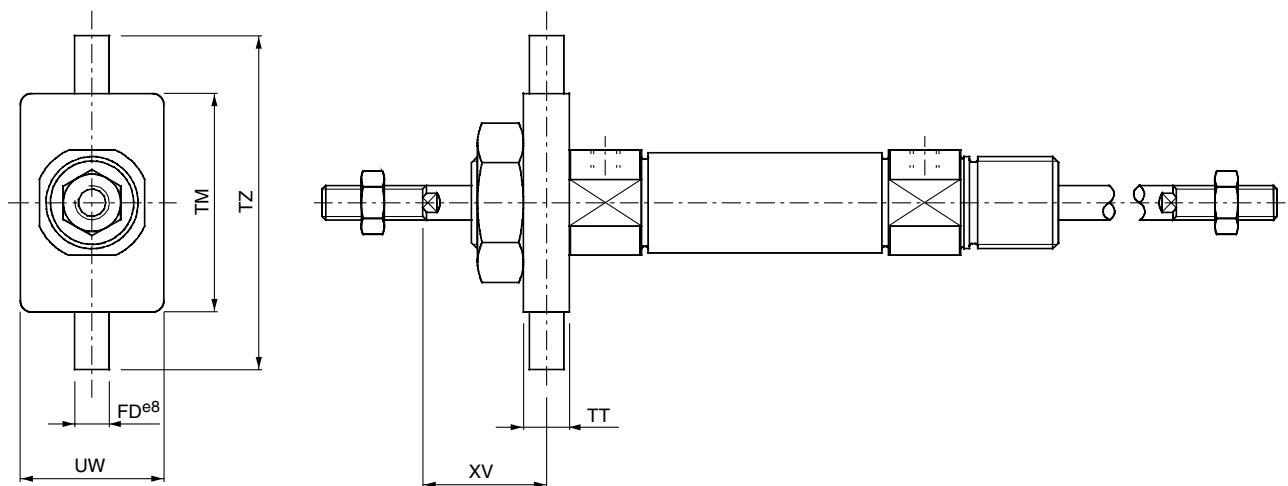
Rod foot, Rod and head foot: C85L10^A, C85L16^A, C85L25^A



Flange: C85F10, C85F16, C85F25



Trunnion: C85T10, C85T16, C85T25



| Bore | Rod foot, Rod and head foot | | | | | | | | | | | Flange | | | | | | Trunnion | | | | | | |
|------|-----------------------------|----|-----|-----|----|--------|--------|---------|------|----|----|--------|----|-------|-----|----|----|----------|----|----|-------|----|----|----|
| | AO | US | øAB | LT | NH | LS | XL | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | TT | UW | TD ø8 | TM | TZ | XV |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 70{76} | 75{81} | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 70{75} | 75{80} | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 80{82} | 88{90} | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 80{82} | 88{90} | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 96 | 103 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 8 | 32 | 6 | 46 | 66 | 20 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 99 | 110 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 8 | 32 | 6 | 46 | 66 | 24 |

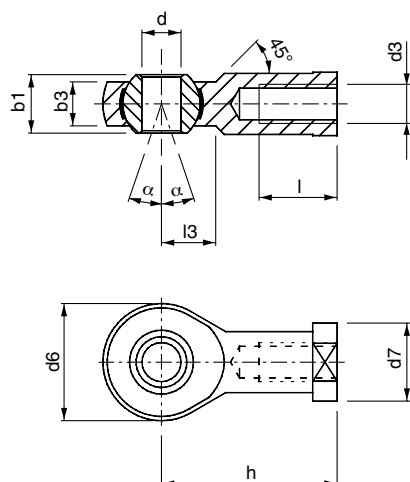
(): In the case of air cushion. { }: In the case of auto switch.

Series C85

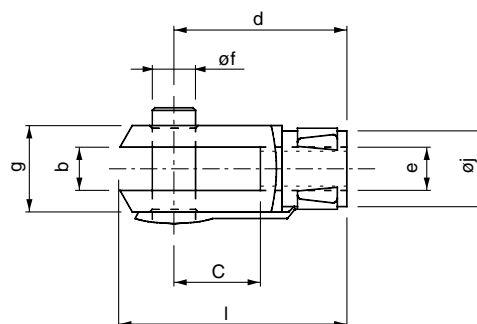
Accessory Dimensions

[First angle projection]

Single Knuckle Joint/DIN648-DIN24335



Double Knuckle Joint/ISO8140-DIN71752



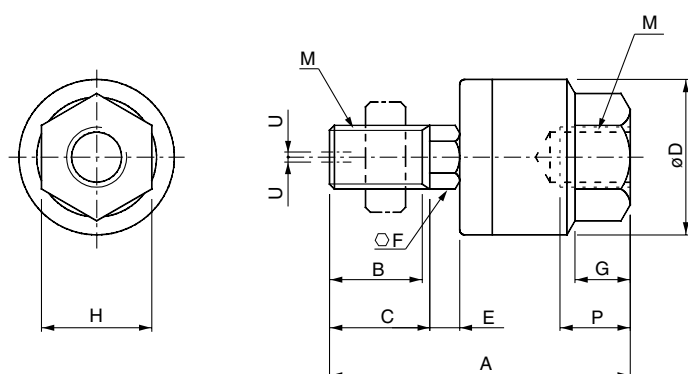
| Bore | Model | Thread d3 | dh7 | h | d6 | b3 | b1 | l | d7 | α^0 | l3 |
|------|-------|------------|-----|----|----|------|----|----|----|------------|----|
| 8 | KJ4D | M4 x 0.7 | 5 | 27 | 18 | 6.0 | 8 | 10 | 11 | 7.5 | 10 |
| 10 | KJ4D | M4 x 0.7 | 5 | 27 | 18 | 6.0 | 8 | 10 | 11 | 7.5 | 10 |
| 12 | KJ6D | M6 x 1 | 6 | 30 | 20 | 6.75 | 9 | 12 | 13 | 6.5 | 10 |
| 16 | KJ6D | M6 x 1 | 6 | 30 | 20 | 6.75 | 9 | 12 | 13 | 6.5 | 10 |
| 20 | KJ8D | M8 x 1.25 | 8 | 36 | 24 | 9 | 12 | 16 | 16 | 13 | 12 |
| 25 | KJ10D | M10 x 1.25 | 10 | 43 | 28 | 10.5 | 14 | 20 | 19 | 13 | 14 |

(mm)

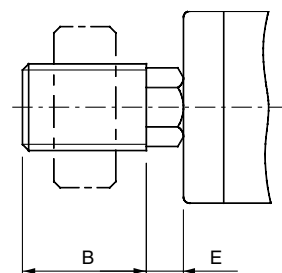
| Bore | Model | Thread e | b | d | f | g | c | j | a |
|------|----------|------------|----|----|----|----|----|----|----|
| 8 | GKM4-8 | M4 x 0.7 | 4 | 16 | 4 | 8 | 8 | 6 | 8 |
| 10 | GKM4-8 | M4 x 0.7 | 4 | 16 | 4 | 8 | 8 | 6 | 8 |
| 12 | GKM6-12 | M6 x 1 | 6 | 24 | 6 | 10 | 12 | 8 | 12 |
| 16 | GKM6-12 | M6 x 1 | 6 | 24 | 6 | 10 | 12 | 8 | 12 |
| 20 | GKM8-16 | M8 x 1.25 | 8 | 32 | 8 | 12 | 16 | 10 | 16 |
| 25 | GKM10-20 | M10 x 1.25 | 10 | 40 | 10 | 18 | 20 | 12 | 20 |

(mm)

Floating joint: Series JA



In the case of dimension without C



| Bore | Model | M | | A | B | C | D | E | F | G | H | Maximum screwed depth P | Allowable eccentricity U | Max. operating tension and compression power (kN) |
|--------|-------------|------------------------|-------|------|------|----|----|-----|---|---|----|-------------------------------|-----------------------------|--|
| | | Nominal thread dia. | Pitch | | | | | | | | | | | |
| 8, 10 | JA10-4-070 | 4 | 0.7 | 26 | 9 | 10 | 12 | 1.5 | 4 | 4 | 7 | 5.5 | 0.5 | 0.054 |
| 12, 16 | JA15-6-100 | 6 | 1 | 34.5 | 12.5 | 14 | 16 | 2 | 6 | 5 | 10 | 7 | 0.5 | 0.123 |
| 20 | JA20-8-125 | 8 | 1.25 | 44 | 17.5 | — | 21 | 4.5 | 7 | 7 | 13 | 8 | 0.5 | 1.1 |
| 25 | JA30-10-125 | 10 | 1.25 | 49.5 | 19.5 | — | 24 | 5 | 8 | 8 | 17 | 9 | 0.5 | 2.5 |

(mm)

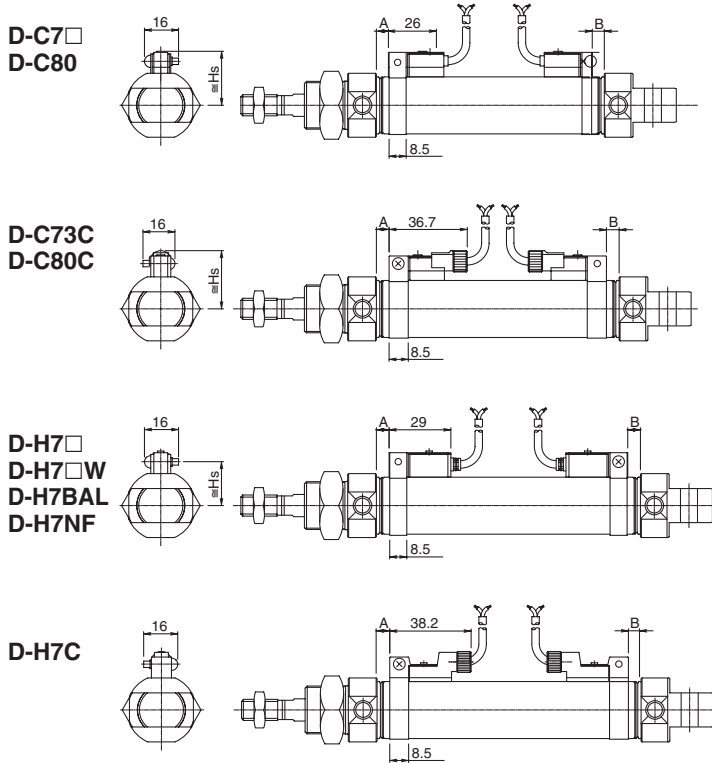
ISO Cylinder: Standard/Non-rotating Type Double Acting, Single/Double Rod **Series C85**

Auto Switch Mounting Position and Mounting Height

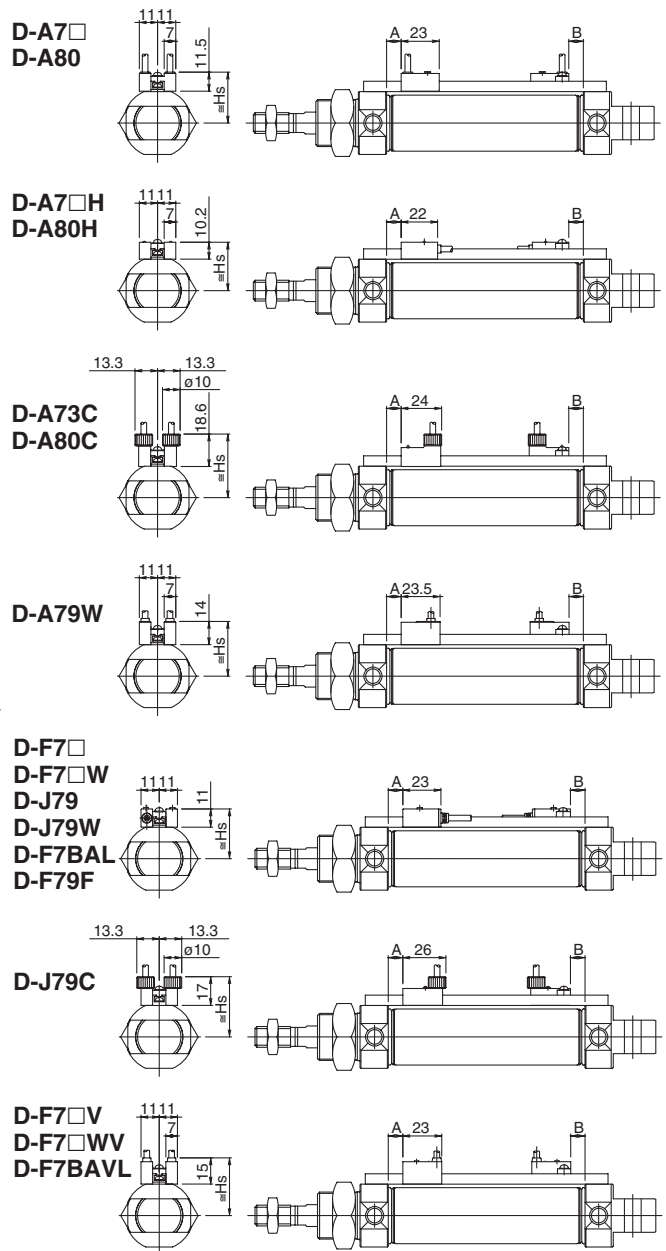
[First angle projection]

Double acting, Single rod

(Band mounting type)



(Rail mounting type)



Auto Switch Mounting Position

(mm)

| Bore | D-C7□ D-C80 D-C73C D-C80C | | D-A73 D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□V/J79 D-F7□W/J79W D-F7□V D-J79C/A72 D-F7BAL D-F79F | | D-H7□ D-H7C D-H7W D-H7BAL D-H7NF | | D-A79W | |
|------|------------------------------------|-----------|----------------|------------|--|-----------|--|-----------|-----------|-----------|
| | A | B | A | B | A | B | A | B | A | B |
| 8 | 3 | 3 | 3.5 | 3.5 | 4 | 4 | 2 | 2 | — | — |
| 10 | 3 (3.5) | 3 (3.5) | 3.5 (4) | 3.5 (4) | 4 (4.5) | 4 (4.5) | 2 (2.5) | 2 (2.5) | — | — |
| 12 | 4 (4.5) | 4 (4.5) | 4.5 (5.5) | 4.5 (5.5) | 5 (6) | 5 (6) | 3 (4) | 3 (4) | — | — |
| 16 | 4 (5) | 10 (7) | 4.5 (5.5) | 10.5 (7.5) | 5 (6) | 11 (8) | 3 (4) | 9 (6) | 2 (3) | 8 (5) |
| 20 | 7 (5) | 6 (4) | 7.5 (5.5) | 6.5 (4.5) | 8 (6) | 7 (5) | 6 (4) | 5 (3) | 5 (3) | 4 (2) |
| 25 | 8.5 (6.5) | 7.5 (5.5) | 9 (7) | 8 (6) | 9.5 (7.5) | 8.5 (6.5) | 7.5 (5.5) | 6.5 (4.5) | 6.5 (4.5) | 5.5 (3.5) |

- () for air cushion type.
- The lower of ø16 is a number for CD85F/Y.
- Aim at this number.

C85 Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C | D-F7□V D-F7WV D-F7BALV |
|------|--|------------------|----------------|--|------------------|-------|--------|--------|------------------------------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 8 | 16 | 18.5 | 18 | 19 | 25 | 19 | — | 23.5 | 21.5 |
| 10 | 17 | 19.5 | 18 | 19 | 25 | 20 | — | 23.5 | 21.5 |
| 12 | 18.5 | 21 | 19.5 | 20.5 | 26.5 | 21 | — | 25 | 23 |
| 16 | 20.5 | 23 | 19.5 | 20.5 | 26.5 | 23 | 22 | 25 | 23 |
| 20 | 22.5 | 25 | 22.5 | 23.5 | 29.5 | 25 | 25 | 29 | 26 |
| 25 | 25 | 27.5 | 25.5 | 26.5 | 32.5 | 27.5 | 28 | 32 | 29 |

- Aim at this number.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

Auto Switch Mounting Position and Mounting Height

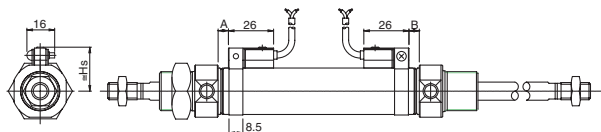
[First angle projection]

Double acting, Double rod

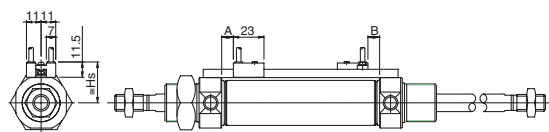
(Band mounting type)

(Rail mounting type)

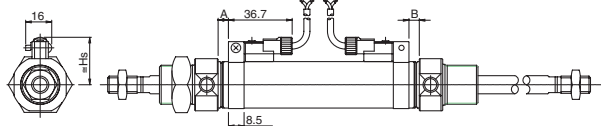
D-C7□
D-C80



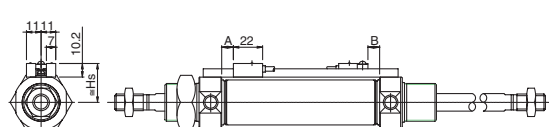
D-A7□
D-A80



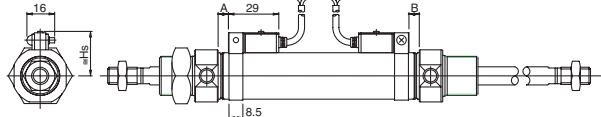
D-C73C
D-C80C



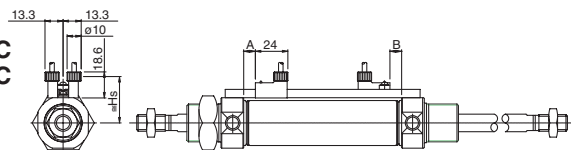
D-A7□H
D-A80H



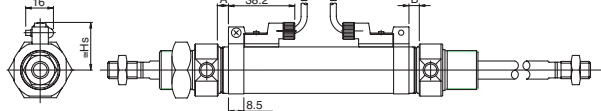
D-H7□
D-H7□W
D-H7BAL
D-H7NF



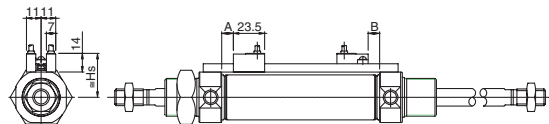
D-A73C
D-A80C



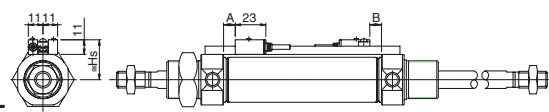
D-H7C



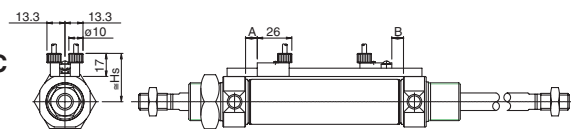
D-A79W



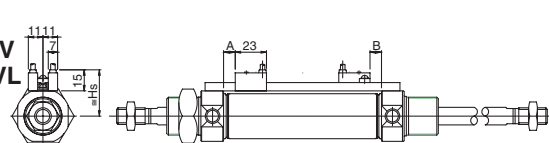
D-F7□
D-F7□W
D-J79
D-J79W
D-F7BAL
D-F79F



D-J79C



D-F7□V
D-F7□WV
D-F7BAVL



Auto Switch Mounting Position

(mm)

| Bore | D-C7□ D-C80 D-C73C D-C80C | | D-A73 D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V D-F7□WV D-J79C D-F7BAL D-F79F/A72 | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | | D-A79W | |
|------|------------------------------------|-----------|----------------|-----------|--|-----------|---|-----------|-----------|-----------|
| | A | B | A | B | A | B | A | B | A | B |
| 8 | 10 | 2 | 10.5 | 2.5 | 11 | 3 | 9 | 1 | — | — |
| 10 | 3 (3.5) | 3 (3.5) | 3.5 (4) | 3.5 (4) | 4 (4.5) | 4 (4.5) | 2 (2.5) | 2 (2.5) | — | — |
| 12 | 4 (4.5) | 4 (4.5) | 4.5 (5.5) | 4.5 (5.5) | 5 (6) | 5 (6) | 3 (4) | 3 (4) | — | — |
| 16 | 4 (5) | 4 (5) | 4.5 (5.5) | 4.5 (5.5) | 5 (6) | 5 (6) | 3 (4) | 3 (4) | 2 (3) | 2 (3) |
| 20 | 7 (5) | 6 (4) | 7.5 (5.5) | 6.5 (4.5) | 8 (6) | 7 (5) | 6 (4) | 5 (3) | 5 (3) | 4 (2) |
| 25 | 8.5 (6.5) | 7.5 (5.5) | 9 (7) | 8 (6) | 9.5 (7.5) | 8.5 (6.5) | 7.5 (5.5) | 6.5 (4.5) | 6.5 (4.5) | 5.5 (3.5) |

• () for air cushion type.

C85 Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C | D-F7□V D-F7□WV D-F7BAVL |
|------|---|------------------|----------------|--|------------------|-------|--------|--------|-------------------------------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 8 | 16 | 18.5 | 18 | 19 | 25 | 19 | — | 23.5 | 21.5 |
| 10 | 17 | 19.5 | 18 | 19 | 25 | 20 | — | 23.5 | 21.5 |
| 12 | 18.5 | 21 | 19.5 | 20.5 | 26.5 | 21 | — | 25 | 23 |
| 16 | 20.5 | 23 | 19.5 | 20.5 | 26.5 | 23 | 22 | 25 | 23 |
| 20 | 22.5 | 25 | 22.5 | 23.5 | 29.5 | 25 | 25 | 29 | 26 |
| 25 | 25 | 27.5 | 25.5 | 26.5 | 32.5 | 27.5 | 28 | 32 | 29 |

• Aim at this number.

ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Single acting,
Spring return/
Spring extended

C D 85 K N 16 40 S B

Built-in magnet

| | |
|-----|-----------------|
| Nil | None |
| D | Built-in magnet |

Type

| | |
|-----|---|
| Nil | Standard |
| K | Non-rotating rod (Rubber cushion only) |

Mounting style

| Symbol | Mounting |
|--------|-------------------------|
| N | Basic integrated clevis |
| E | Double end |
| F | Front nose |
| Y* | Front nose in line port |

* Except single acting spring extended type.

Auto switch
mounting style

| | |
|---|---------------|
| A | Rail mounting |
| B | Band mounting |

Applicable auto switches and bands are shown on page 6-11-44. Please order auto switches and bands separately.

Option

| | |
|----|--|
| R | Stainless steel piston rod, rod end nut and mounting nut |
| R2 | Stainless steel piston rod and rod end nut |

Bore size

Stroke

| Bore size (mm) | Standard stroke (mm)* | Max. stroke |
|----------------|-----------------------------------|-------------|
| 8* | 10, 25, 40, 50 | 50 |
| 10 | | |
| 12 | | |
| 16 | 10, 25, 40, 50, 80, 100, 125, 150 | 150 |
| 20 | | |
| 25 | | |

* Other strokes available on request.

Action

| | |
|---|--------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extended |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Mounting Bracket Part No.

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|------------------|---------------------------------------|------------|----|------------|----|------------|-------------|
| Mounting bracket | Foot (1 pc.) | C85L10A | | C85L16A | | C85L25A | |
| | Foot (2 pcs. with mounting nut 1 pc.) | C85L10B | | C85L16B | | C85L25B | |
| | Flange | C85F10 | | C85F16 | | C85F25 | |
| | Trunnion | C85T10 | | C85T16 | | C85T25 | |
| | Clevis | C85C10 | | C85C16 | | C85C25 | |
| Accessory | Single knuckle joint | KJ4D | | KJ6D | | KJ8D | KJ10D |
| | Double knuckle joint | GKM4-8 | | GKM6-10 | | GKM8-16 | GKM10-20 |
| | Floating joint | JA10-4-070 | | JA15-6-100 | | JA20-8-125 | JA30-10-125 |

Replacement Parts For Standard Cylinders

| Bore size (mm) | Part no. | Note |
|----------------|----------|--|
| 20 | C85-20PS | Every set includes: n°1 rod packing n°1 packing retaining washer n°1 retaining ring |
| 25 | C85-25PS | |

For Non-rotating Cylinders ("K")

| Bore size (mm) | Part no. | Note |
|----------------|-----------|--|
| 20 | C85K-20PS | Every set includes: n°1 rod packing n°1 packing retaining washer n°1 retaining ring |
| 25 | C85K-25PS | |

Series C85



Spring return



Spring extended

Rubber cushion

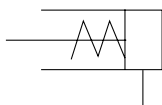


Non-rotating

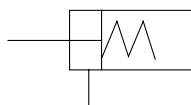
Specifications

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|-------------------------------|-----------------|--|----------|----------|----------|-----------|------------|
| Piston rod dia. (mm) | | 4 | 4 | 6 | 6 | 8 | 10 |
| Piston rod thread | | M4 x 0.7 | M4 x 0.7 | M6 x 1 | M6 x 1 | M8 x 1.25 | M10 x 1.25 |
| Port size | | M5 x 0.8 | M5 x 0.8 | M5 x 0.8 | M5 x 0.8 | G 1/8 | G 1/8 |
| Action | | Single acting, Single rod, Spring return/extend | | | | | |
| Fluid | | Air | | | | | |
| Proof pressure | | 1.5 MPa | | | | | |
| Max. operating pressure | | 1.0 MPa | | | | | |
| Min. operating pressure | Spring return | 0.22 MPa | 0.18 MPa | | 0.13 MPa | 0.18 MPa | |
| | Spring extended | | | | | 0.23 MPa | |
| Ambient and fluid temperature | | -20 to 80°C (Built-in magnet type: -10 to 60°C) | | | | | |
| Cushion | | Rubber cushion (Standard) | | | | | |
| Lubrication | | Not required. Use turbine oil Class 1 ISO VG32, if lubricated. | | | | | |
| Piston speed | | 50 to 1500 mm/s | | | | | |
| Allowable kinetic energy | | 0.02 J | 0.03 J | 0.04 J | 0.09 J | 0.27 J | 0.4 J |
| Non-rotating accuracy* | | ±1° 30' | ±1° 30' | ± 1° | ±1° | ±0° 42' | ±0° 42' |
| Stroke tolerance (mm) | | 0/+1 | | | | 0/+1.4 | |

JIS Symbol
Standard

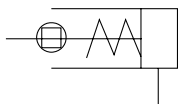


Spring return

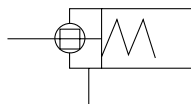


Spring extended

Non-rotating



Spring return



Spring extended

Spring Retracting Force (Standard, Non-rotating)

Spring Return

(N)

| Bore size (mm) | Standard stroke (mm) | Spring force | | | | | | | | | |
|----------------|----------------------|--------------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
| | | 10 | | 25 | | 50 | | 100 | | 150 | |
| | | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended | Retract | Extended |
| 8 | 10, 25, 50 | 4.41 | 4.02 | 4.41 | 3.43 | 4.41 | 2.45 | — | — | — | — |
| 10 | | 6.28 | 5.69 | 6.28 | 4.90 | 6.28 | 3.53 | — | — | — | — |
| 12 | | 7.16 | 6.57 | 7.16 | 5.79 | 7.16 | 4.41 | — | — | — | — |
| 16 | 10, 25, 50, 100, 150 | 13.2 | 12.1 | 13.2 | 10.3 | 13.2 | 7.45 | 13.2 | 7.45 | 13.2 | 7.45 |
| 20 | | 21.6 | 18.6 | 21.6 | 16.7 | 21.6 | 11.8 | 39.2 | 9.81 | 39.2 | 9.81 |
| 25 | | 27.5 | 25.3 | 27.5 | 22.1 | 27.5 | 16.7 | 47.1 | 13.7 | 47.1 | 15.7 |

Spring Extended

(N)

| Bore size (mm) | Standard stroke (mm) | Spring force | | | | | | | | | |
|----------------|----------------------|--------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| | | 10 | | 25 | | 50 | | 100 | | 150 | |
| | | Retract | Extend | Retract | Extend | Retract | Extend | Retract | Extend | Retract | Extend |
| 8 | 10, 25, 50 | 5.30 | 3.92 | 5.30 | 3.14 | 5.30 | 2.65 | — | — | — | — |
| 10 | | 5.98 | 4.81 | 5.98 | 4.02 | 5.98 | 3.53 | — | — | — | — |
| 12 | | 6.57 | 5.59 | 6.57 | 4.90 | 6.57 | 4.51 | — | — | — | — |
| 16 | 10, 25, 50, 100, 150 | 14.7 | 11.3 | 14.7 | 9.22 | 14.7 | 7.85 | 14.7 | 7.85 | 14.7 | 7.85 |
| 20 | | 39.2 | 33.0 | 39.2 | 23.5 | 39.2 | 9.81 | 39.2 | 9.81 | 39.2 | 9.81 |
| 25 | | 47.1 | 40.4 | 47.1 | 30.4 | 47.1 | 13.7 | 47.1 | 13.7 | 47.1 | 15.7 |

ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

Auto Switch Mounting, Minimum Possible Cylinder Stroke

Band Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|-----------------|-----------|-------|
| | 3 pcs. | | 2 pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 55 | 90 | 15 | 50 | 10 |
| D-C73C D-C80C D-H7C | 65 | 105 | 15 | 65 | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 60 | 105 | 15 | 60 | 10 |

Rail Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---------------------------------------|----------------------|--------|-------|
| | 3 pcs. | 2 pcs. | |
| | | | |
| D-A7□/A80 D-A73C/A80C | 35 | 10 | 5 |
| D-A7□H D-A80H | 45 | 10 | 5 |
| D-A79W * | 40 | 15 | 10 |
| D-F7□ D-J79 | 45 | 5 | 5 |
| D-F7□V D-J79C | 30 | 5 | 5 |
| D-F7□W D-J79W D-F7BAL D-F79F | 55 | 15 | 10 |
| D-F7□WV D-F7BAVL | 40 | 15 | 10 |

* "D-A79W" cannot be mounted on bore size ø8, ø10, ø12 cylinder.

Band Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|--|------------------|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $50 + 45(n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $65 + 50(n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | $60 + 55(n - 2)$ | 10 |

Rail Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---|----------------------|--|-------|
| | 2 pcs. | n pcs. | |
| | | | |
| D-A7□/A80 D-A7□H/A80H D-A73C/A80C D-F7□ D-F7□V D-J79 D-J79C | 10 | $10 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 5 |
| D-A79W D-F7□W D-J79W D-F7BAL D-F79F D-F7□WV D-F7BAVL | 15 | $15 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

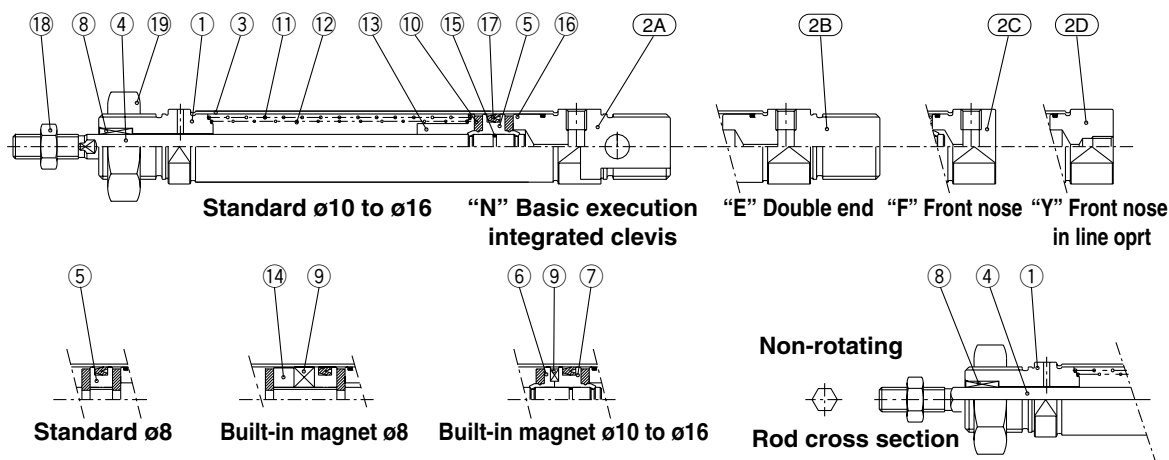
Series C85

Construction

[First angle projection]

Single acting, Single rod

Spring return: C□85□8 to 16-□S (Disassembly is not possible.)

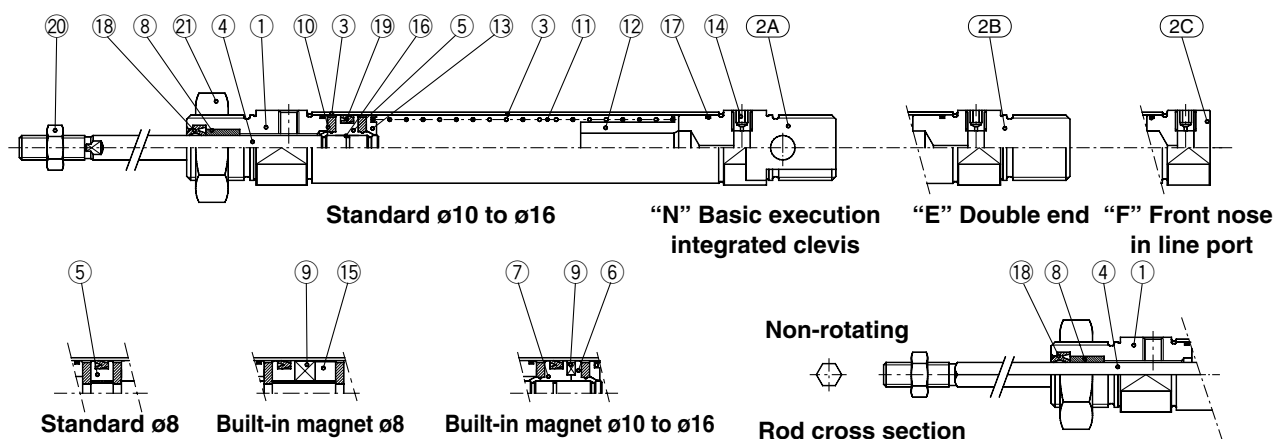


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover N | Aluminum alloy | 1 | White anodized |
| ②B | Head cover E | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Stainless steel | 1 | |
| ⑤ | Piston | Brass | 1 | |
| ⑥ | Piston A | Brass | 1 | (Switch type only) |
| ⑦ | Piston B | Brass | 1 | (Switch type only) |
| ⑧ | Bush | Sintered bronze | 1 | |

| No. | Description | Material | Qty. | Note |
|-----|-----------------|--------------|------|---------------------|
| ⑨ | Magnet | Magnet | 1 | (Switch type only) |
| ⑩ | Bumper | Urethane | 2 | |
| ⑪ | Return spring A | Piano wire | 1 | |
| ⑫ | Return spring B | Piano wire | 1 | |
| ⑬ | Spring guide | Brass | 1 | |
| ⑭ | Spacer | Brass | 1 | |
| ⑮ | Piston gasket | NBR | 1 | (2 for switch type) |
| ⑯ | Tube gasket | NBR | 1 | |
| ⑰ | Piston seal | NBR | 1 | |
| ⑱ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑲ | Mounting nut | Carbon steel | 1 | Nickel plating |

Spring Extended: C□85□8 to 16-□T (Disassembly is not possible.)



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②A | Head cover N | Aluminum alloy | 1 | White anodized |
| ②B | Head cover E | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Stainless steel | 1 | |
| ⑤ | Piston | Brass | 1 | |
| ⑥ | Piston A | Brass | 1 | (Switch type only) |
| ⑦ | Piston B | Brass | 1 | (Switch type only) |
| ⑧ | Bush | Sintered bronze | 1 | |
| ⑨ | Magnet | Magnet | 1 | (Switch type only) |

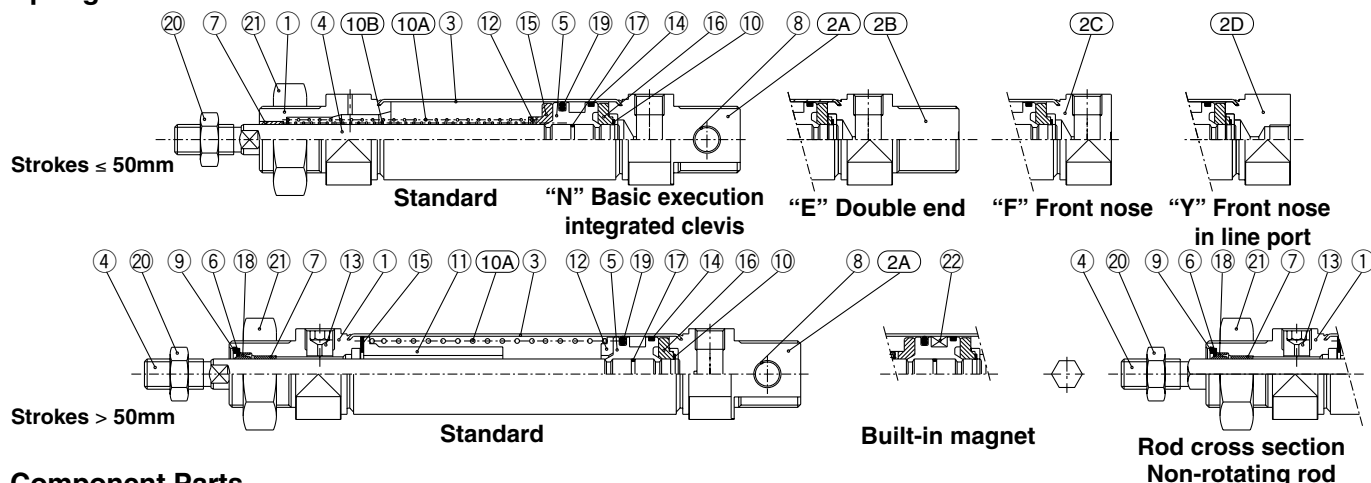
| No. | Description | Material | Qty. | Note |
|-----|-----------------|--------------|------|---------------------|
| ⑩ | Bumper | Urethane | 2 | |
| ⑪ | Return spring C | Piano wire | 1 | |
| ⑫ | Spring guide | Brass | 1 | |
| ⑬ | Spring seat | Brass | 1 | |
| ⑭ | Plug | Steel | 1 | |
| ⑮ | Spacer | Brass | 1 | |
| ⑯ | Piston gasket | NBR | 1 | (2 for switch type) |
| ⑰ | Tube gasket | NBR | 1 | |
| ⑱ | Rod seal | NBR | 1 | |
| ⑲ | Piston seal | NBR | 1 | |
| ⑳ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Mounting nut | Carbon steel | 1 | Nickel plating |

ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

Construction

[First angle projection]

Single acting, Single rod
Spring return: **C□85□20/25-□S**

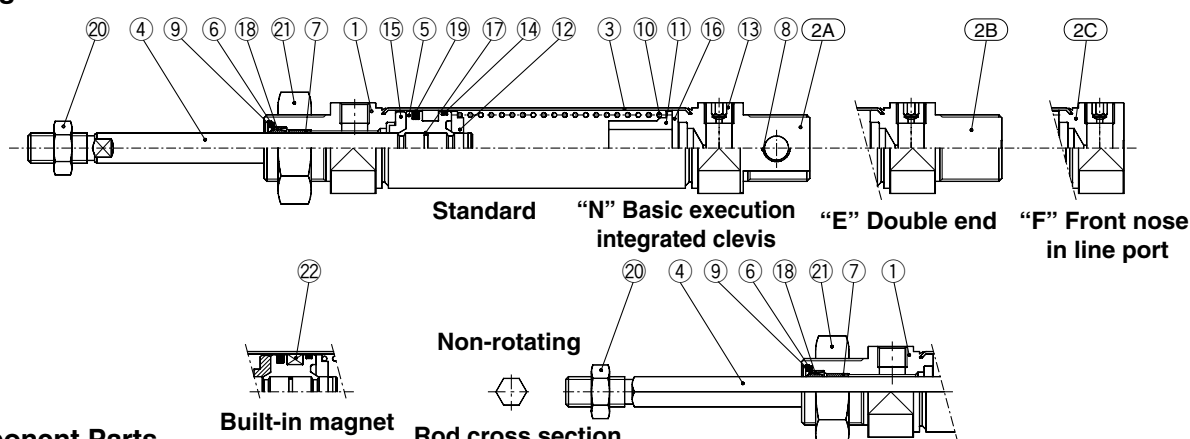


Component Parts

| No. | Description | Material | Qty. | Note |
|-------|-----------------|-----------------|------|--------------------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| (2A) | Head cover N | Aluminum alloy | 1 | White anodized |
| (2B) | Head cover E | Aluminum alloy | 1 | White anodized |
| (2C) | Head cover F | Aluminum alloy | 1 | White anodized |
| (2D) | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated Chromate |
| ⑤ | Piston | Aluminum alloy | 1 | |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Bush | Sintered bronze | 1 | |
| ⑨ | Retaining ring | Stainless steel | 1 | Nickel plating |
| ⑩ | Retaining ring | Stainless steel | 1 | |
| (10A) | Return spring A | Piano wire | 1 | Zinc chromated |

| No. | Description | Material | Qty. | Note |
|-------|-----------------|----------------|------|--------------------|
| (10B) | Return spring B | Piano wire | 1 | Zinc chromated |
| ⑪ | Spring guide | Aluminum alloy | 1 | |
| ⑫ | Spring holder | Aluminum alloy | 1 | |
| ⑬ | Set screw | Carbon steel | 1 | |
| ⑭ | Wear ring | Resin | 1 | |
| ⑮ | Bumper A | Urethane | 1 | |
| ⑯ | Bumper B | Urethane | 1 | |
| ⑰ | Piston gasket | NBR | 1 | |
| ⑱ | Rod seal | NBR | 1 | |
| ⑲ | Piston seal | NBR | 1 | |
| ⑳ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ㉒ | Magnet | Magnet | 1 | (Switch type only) |

Spring extended: **C□85□20/25-□T**



Component Parts

| No. | Description | Material | Qty. | Note |
|------|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| (2A) | Head cover N | Aluminum alloy | 1 | White anodized |
| (2B) | Head cover E | Aluminum alloy | 1 | White anodized |
| (2C) | Head cover F | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Bush | Sintered bronze | 1 | |
| ⑨ | Retaining ring | Carbon steel | 1 | Nickel plating |
| ⑩ | Return spring | Piano wire | 1 | Zinc chromated |

| No. | Description | Material | Qty. | Note |
|-----|---------------|----------------|------|--------------------|
| ⑪ | Spring guide | Aluminum alloy | 1 | |
| ⑫ | Spring guide | Aluminum alloy | 1 | |
| ⑬ | Set screw | Carbon steel | 1 | |
| ⑭ | Wear ring | Resin | 1 | |
| ⑮ | Bumper A | Urethane | 1 | |
| ⑯ | Bumper B | Urethane | 1 | |
| ⑰ | Piston gasket | NBR | 1 | |
| ⑱ | Rod seal | NBR | 1 | |
| ⑲ | Piston seal | NBR | 1 | |
| ⑳ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ㉑ | Mounting nut | Carbon steel | 1 | Nickel plating |
| ㉒ | Magnet | Magnet | 1 | (Switch type only) |

Series C85

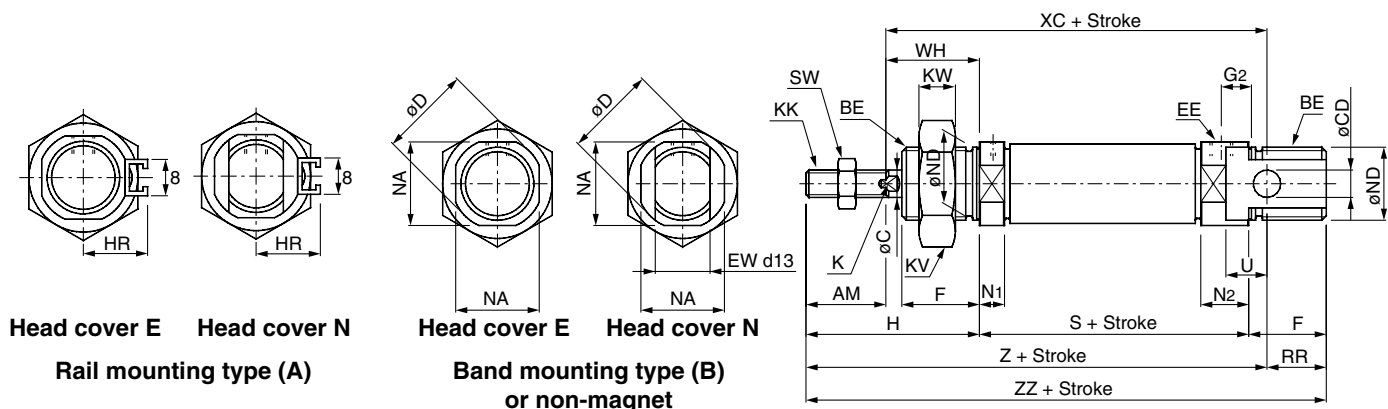
Dimensions

[First angle projection]

Single acting, Spring return

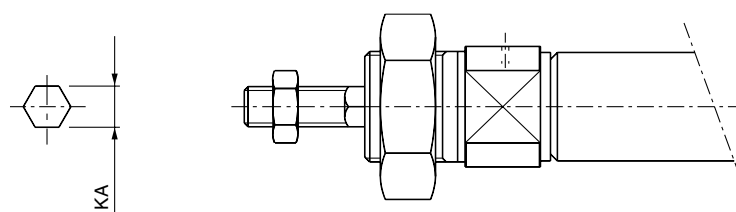
C 85^N_E **Bore** — **Stroke** S —

Without magnet, Built-in magnet



C□85KN, C□85KE

Non-rotating (Piston rod)



Rod cross section

| (mm) | | | | | | | | | | | | | | | | | | | | | | | | |
|------|----|------------|----|--------|------|----------|----|----|----|----|------|---|------|------------|----|----|-----|------|------|--------|----|----|----|----|
| Bore | AM | BE | øC | øCD H9 | øD | EE | EW | F | G2 | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | øND h8 | RR | SW | U | WH |
| 8 | 12 | M12 x 1.25 | 4 | 4 | 16.7 | M5 x 0.8 | 8 | 12 | 5 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 5.5 | 9.5 | 15 | 12 | 10 | 7 | 6 | 16 |
| 10 | 12 | M12 x 1.25 | 4 | 4 | 16.7 | M5 x 0.8 | 8 | 12 | 5 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 5.5 | 9.5 | 15 | 12 | 10 | 7 | 6 | 16 |
| 12 | 16 | M16 x 1.5 | 6 | 6 | 19.7 | M5 x 0.8 | 12 | 17 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 5.5 | 10.5 | 18.3 | 16 | 14 | 10 | 9 | 22 |
| 16 | 16 | M16 x 1.5 | 6 | 6 | 19.7 | M5 x 0.8 | 12 | 17 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 5.5 | 10.5 | 18.3 | 16 | 13 | 10 | 9 | 22 |
| 20 | 20 | M22 x 1.5 | 8 | 8 | 28 | G 1/8 | 16 | 20 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 22 | 11 | 13 | 12 | 24 |
| 25 | 22 | M22 x 1.5 | 10 | | 33.5 | G 1/8 | 16 | 22 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 22 | 11 | 17 | 12 | 28 |

| (mm) | | | | | | | | | | | | |
|------|--------------------|--------------------|----------------------|--------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Bore | S | | | XC | | | Z | | | ZZ | | |
| | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 46{52}{56{62}} | — | — | 64{70}{74{80}} | — | — | 76{82}{86{92}} | — | — | 86{92}{96{102}} | — | — |
| 10 | 46{50}{56{60}} | — | — | 64{68}{74{78}} | — | — | 76{80}{86{90}} | — | — | 86{90}{96{100}} | — | — |
| 12 | 50{53.5}{60{63.5}} | — | — | 75{78.5}{85{88.5}} | — | — | 91{94.5}{101{104.5}} | — | — | 105{108.5}{115{118.5}} | — | — |
| 16 | 56{59.5}{66{69.5}} | 71.5{75}{92{95.5}} | 87{90.5}{118{121.5}} | 82{85.5}{92{95.5}} | 97.5{101}{118{121.5}} | 113{116.5}{144{147.5}} | 98{101.5}{108{111.5}} | 113.5{117}{134{137.5}} | 129{132.5}{160{163.5}} | 111{114.5}{121{124.5}} | 126.5{130}{147{150.5}} | 142{145.5}{173{176.5}} |
| 20 | 62{87} | 112 | 137 | 95{120} | 145 | 170 | 115{140} | 165 | 190 | 126{151} | 176 | 201 |
| 25 | 65{88.5} | 113.5 | 138.5 | 104{127.5} | 152.5 | 177.5 | 126{149.5} | 174.5 | 199.5 | 137{160.5} | 185.5 | 210.5 |

(): In the case of auto switch style. { }: In the case of non-rotating rod.

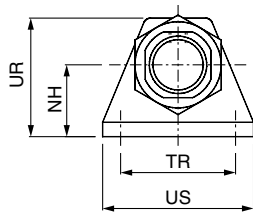
ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

Dimensions with Mounting Bracket

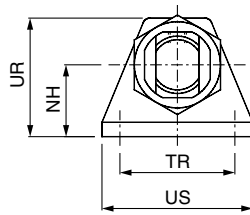
[First angle projection]

Single acting, Spring return

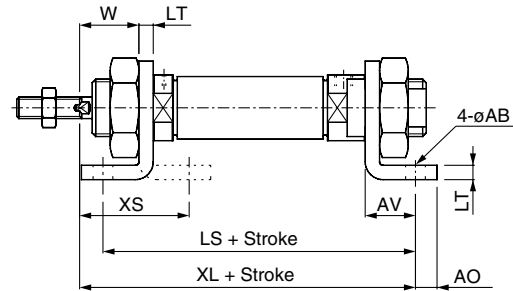
Rod foot, Rod and head foot: C85L10^A, C85L16^A, C85L25^A



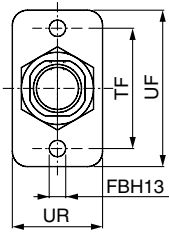
Head cover E



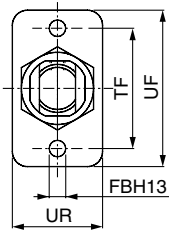
Head cover N



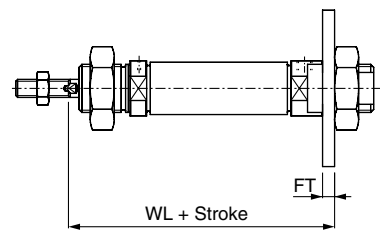
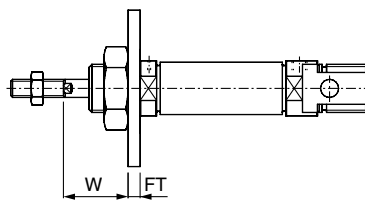
Rod flange, Head flange: C85F10, C85F16, C85F25



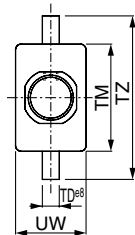
Head cover E



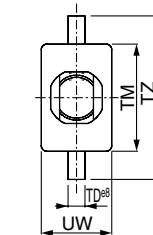
Head cover N



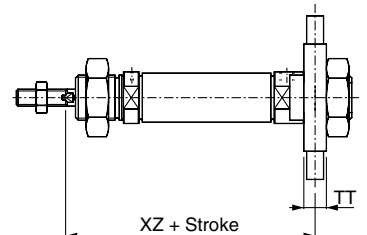
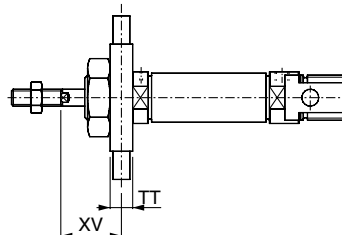
Rod trunnion, Head trunnion: C85T10, C85T16, C85T25



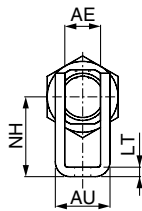
Head cover E



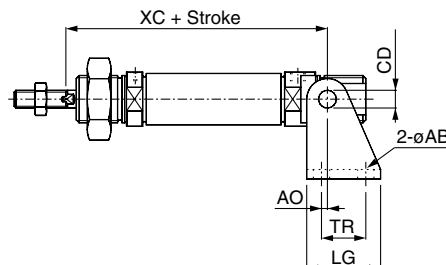
Head cover N



Clevis: C85C10, C85C16, C85C25



Head cover N



| Rod foot, Rod and head foot | | | | | | | | | | | Rod flange, Head flange | | | | | | | | | | | | | | |
|-----------------------------|----|----|-----|-----|----|------------------------|---------------------------|----------------------------|--------------------------|----------------------------|----------------------------|---------|------|----|----|------|----|-------|-----|----|----|------|----------------------------|---------------------------|----------------------------|
| Bore | AO | US | φAB | LT | NH | LS | | | XL | | | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | WL | | |
| | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | | | | | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 68(74) (78(84)) | — | — | 73(79) (83(89)) | — | — | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 65.2(71.2) (75.2(81.2)) | — | — |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 68(72) (78(82)) | — | — | 73(77) (83(87)) | — | — | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 65.2(69.2) (75.2(79.2)) | — | — |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 78(81.5) (88(91.5)) | — | — | 86(89.5) (96(99.5)) | — | — | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 76(79.5) (86(89.5)) | — | — |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 84(87.5) (94(97.5)) | 99.5(103) (120(123.5)) | 115(118.5) (146(149.5)) | 92(95.5) (102(105.5)) | 107.5(111) (128(131.5)) | 123(126.5) (154(157.5)) | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 82(85.5) (92(95.5)) | 97.5(101) (118(121.5)) | 113(116.5) (144(147.5)) |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 96{121} | 146 | 171 | 103{128} | 153 | 178 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 91{116} | 141 | 166 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 96{122.5} | 147.5 | 172.5 | 110{133.5} | 158.5 | 183.5 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 98{121.5} | 146.5 | 171.5 |

| Bore | Rod trunnion, Head trunion | | | | | | | | | Clevis | | | | | | | | | | | | |
|------|----------------------------|----|-------|----|----|----|------------------------|---------------------------|----------------------------|--------|------|-----|-----|------|------|----|----|-----|------------------------|---------------------------|----------------------------|------------|
| | TT | UW | TD e8 | TM | TZ | XV | XZ | | | øCD | H9 | AE | øAB | AO | AU | TR | LG | NH | LT | XC | | |
| | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | | | | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 6 | 20 | 4 | 26 | 38 | 13 | 65(71) (75(81)) | — | — | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 64(70) (74(80)) | — | — | |
| 10 | 6 | 20 | 4 | 26 | 38 | 13 | 65(69) (75(79)) | — | — | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 64(68) (74(78)) | — | — | |
| 12 | 8 | 25 | 6 | 38 | 58 | 18 | 76(79.5) (86(89.5)) | — | — | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 75(78.5) (85(88.5)) | — | — | |
| 16 | 8 | 25 | 6 | 38 | 58 | 18 | 82(85.5) (92(95.5)) | 97.5(101) (118(121.5)) | 113(116.5) (144(147.5)) | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 82(88.5) (92(95.5)) | 97.5(101) (118(121.5)) | 113(116.5) (144(147.5)) | |
| 20 | 8 | 32 | 6 | 46 | 66 | 20 | 90(115) | 140 | 165 | 8 | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 95(120) | 145 | 170 | |
| 25 | 8 | 32 | 6 | 46 | 66 | 24 | 97(120.5) | 145.5 | 170.5 | | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 104(127.5) | 152.5 | 177.5 | |

(): In the case of auto switch style. { }: In the case of non-rotating rod.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

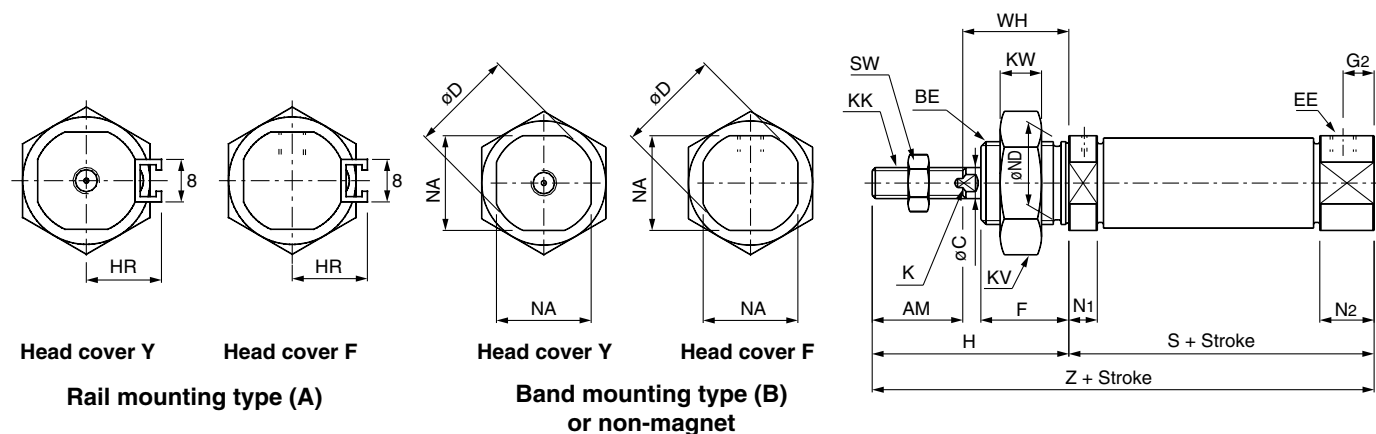
Dimensions

[First angle projection]

Single acting, Spring return

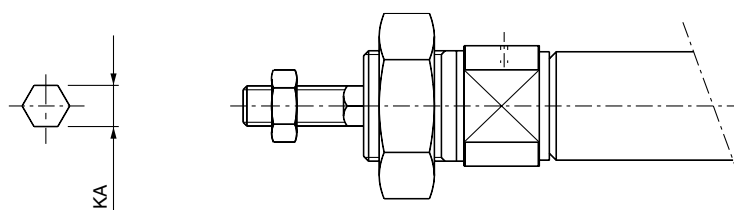
C□85^F_Y Bore—Stroke S—□

Without magnet, Built-in magnet



C□85KF, C□85KY

Non-rotating (Piston rod)



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | EE | F | G2 | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | øND h8 | SW | WH |
|------|----|------------|----|------|----------|----|----|----|------|---|------|------------|----|----|-----|------|------|--------|----|----|
| 8 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 5 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 5.5 | 9.5 | 15 | 12 | 7 | 16 |
| 10 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 5 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 5.5 | 9.5 | 15 | 12 | 7 | 16 |
| 12 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 5.5 | 10.5 | 18.3 | 16 | 10 | 22 |
| 16 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 6 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 5.5 | 10.5 | 18.3 | 16 | 10 | 22 |
| 20 | 20 | M22 x 1.5 | 8 | 28 | G 1/8 | 20 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 22 | 13 | 24 |
| 25 | 22 | M22 x 1.5 | 10 | 33.5 | G 1/8 | 22 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 22 | 17 | 28 |

| Bore | S | | | Z | | |
|------|--------------------|--------------------|----------------------|---------------------|------------------------|------------------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 46(52){56(62)} | — | — | 74(80){84(90)} | — | — |
| 10 | 46(50){56(60)} | — | — | 74(78){84(88)} | — | — |
| 12 | 50(53.5){60(63.5)} | — | — | 88(91.5){98(101.5)} | — | — |
| 16 | 50(53.5){60(63.5)} | 65.5(69){86(89.5)} | 81(84.5){112(115.5)} | 88(91.5){98(101.5)} | 103.5(107){124(127.5)} | 119(122.5){150(153.5)} |
| 20 | 62{87} | 112 | 137 | 106{131} | 156 | 181 |
| 25 | 65{88.5} | 113.5 | 138.5 | 115{138.5} | 163.5 | 188.5 |

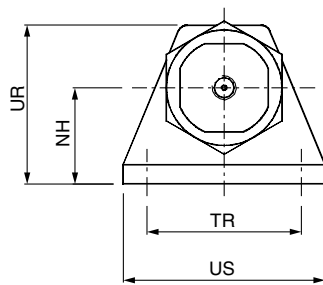
(): In the case of auto switch type. { }: In the case of non-rotating.

ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

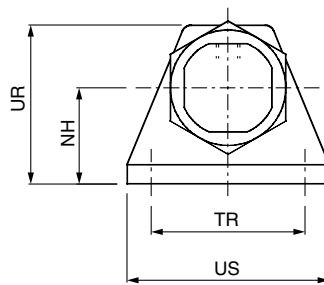
Dimensions with Mounting Bracket

[First angle projection]

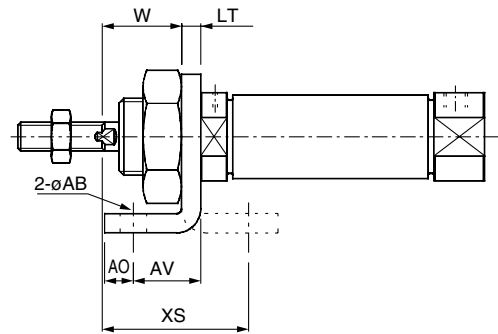
Single acting, Spring return
Rod foot: C85L10A, C85L16A, C85L25A



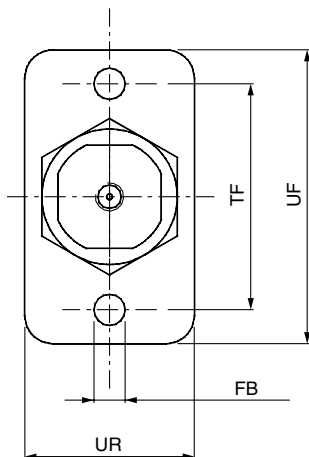
Head cover Y



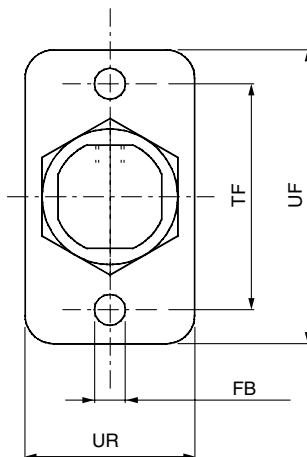
Head cover F



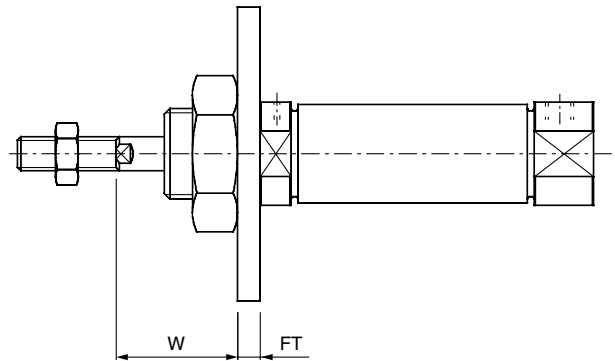
Rod flange: C85F10, C85F16, C85F25



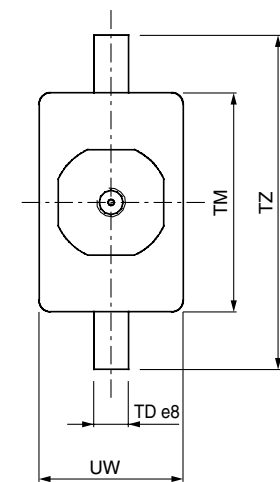
Head cover Y



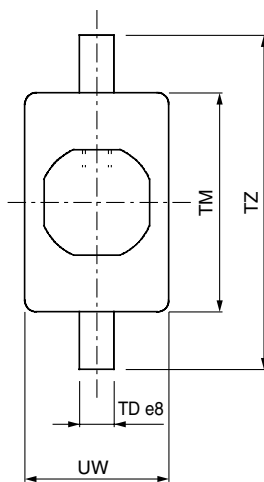
Head cover F



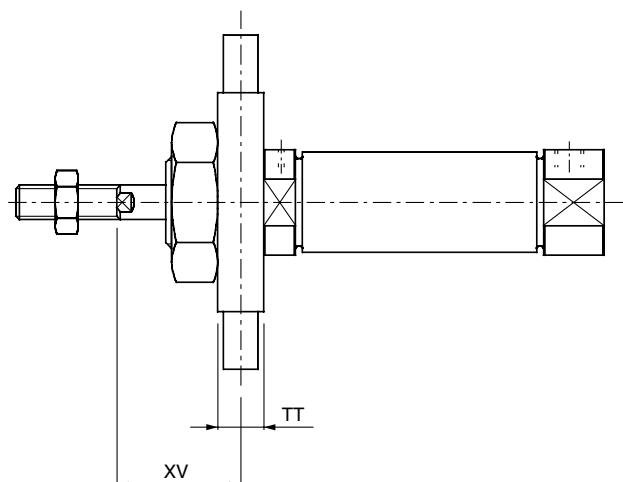
Rod trunnion: C85T10, C85T16, C85T25



Head cover Y



Head cover F



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

| (mm) | | | | | | | | | | | | | | | | | | | | | | |
|------|----------|----|-----|-----|----|---------|------|----|----|------|------------|-------|-----|----|----|------|--------------|----|-------|----|----|----|
| Bore | Rod foot | | | | | | | | | | Rod flange | | | | | | Rod trunnion | | | | | |
| | AO | US | øAB | LT | NH | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | TT | UW | TD e8 | TM | TZ | XV |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 8 | 32 | 6 | 46 | 66 | 20 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 8 | 32 | 6 | 46 | 66 | 24 |

Series C85

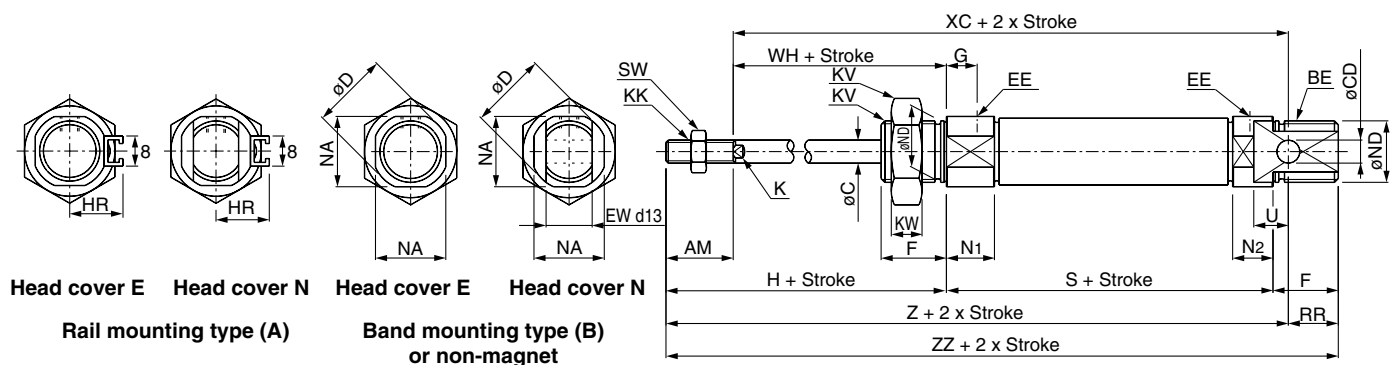
Dimensions

[First angle projection]

Single acting, Spring return

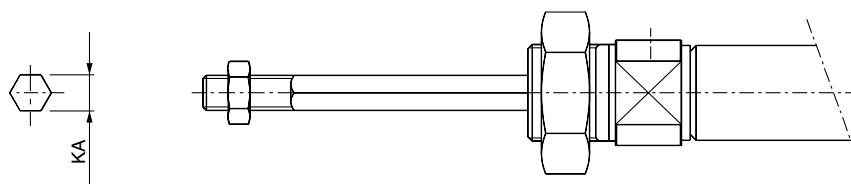
C□85^N Bore—Stroke T—□

Without magnet, Built-in magnet



C□85KN/E

Non-rotating (Piston rod)



Rod cross section

| (mm) | | | | | | | | | | | | | | | | | | | | | | | | |
|------|----|------------|----|-------|------|----------|----|----|---|----|------|---|------|------------|----|----|------|------|------|-------|----|----|----|----|
| Bore | AM | BE | KC | ND h9 | ND | EE | EW | F | G | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | ND h8 | RR | SW | U | WH |
| 8 | 12 | M12 x 1.25 | 4 | 4 | 16.7 | M5 x 0.8 | 8 | 12 | 7 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 10 | 7 | 6 | 16 |
| 10 | 12 | M12 x 1.25 | 4 | 4 | 16.7 | M5 x 0.8 | 8 | 12 | 7 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 12 | 10 | 7 | 6 | 16 |
| 12 | 16 | M16 x 1.5 | 6 | 6 | 19.7 | M5 x 0.8 | 12 | 17 | 8 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 14 | 10 | 9 | 22 |
| 16 | 16 | M16 x 1.5 | 6 | 6 | 19.7 | M5 x 0.8 | 12 | 17 | 8 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 16 | 13 | 10 | 9 | 22 |
| 20 | 20 | M22 x 1.5 | 8 | 8 | 28 | G 1/8 | 16 | 20 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 22 | 11 | 13 | 12 | 24 |
| 25 | 22 | M22 x 1.5 | 10 | | 33.5 | G 1/8 | 16 | 22 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 22 | 11 | 17 | 12 | 28 |

| Bore | S | | | Z | | | XC | | | ZZ | | |
|------|------------|------------|------------|-------------|------------|------------|------------|------------|------------|--------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 64.5(70.5) | — | — | 94.5(100.5) | — | — | 82.5(88.5) | — | — | 104.5(110.5) | — | — |
| 10 | 64.5(68.5) | — | — | 94.5(98.5) | — | — | 82.5(86.5) | — | — | 104.5(108.5) | — | — |
| 12 | 70(73.5) | — | — | 111(114.5) | — | — | 95(98.5) | — | — | 125(128.5) | — | — |
| 16 | 75(78.5) | 101(104.5) | 127(130.5) | 117(120.5) | 143(146.5) | 169(172.5) | 101(104.5) | 127(130.5) | 153(156.5) | 130(133.5) | 156(159.5) | 182(185.5) |
| 20 | 87 | 112 | 137 | 140 | 165 | 190 | 120 | 145 | 170 | 151 | 176 | 201 |
| 25 | 88.5 | 113.5 | 138.5 | 149.5 | 174.5 | 199.5 | 127.5 | 152.5 | 177.5 | 160.5 | 185.5 | 210.5 |

(): In the case of auto switch style.

ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

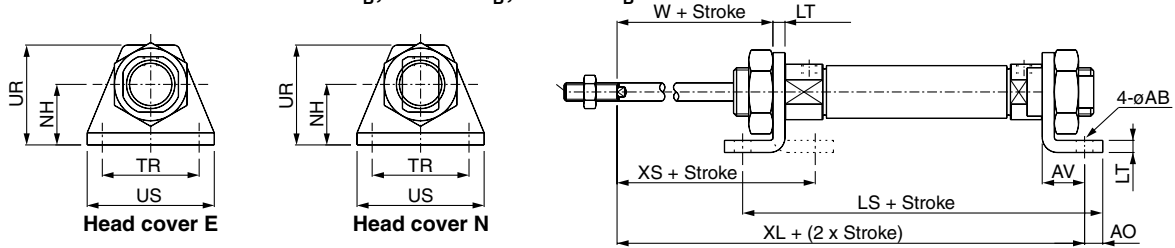
Dimensions with Mounting Bracket

[First angle projection]

Single acting, Spring extended

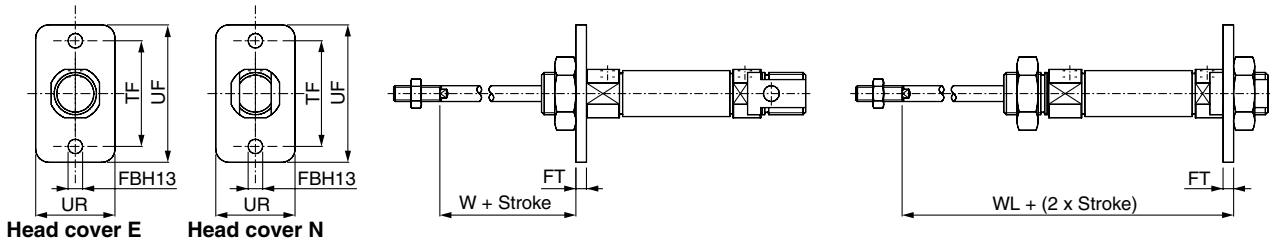
C□85N, C□85E

Rod foot, Rod and head foot: C85L10^A_B, C85L16^A_B, C85L25^A_B



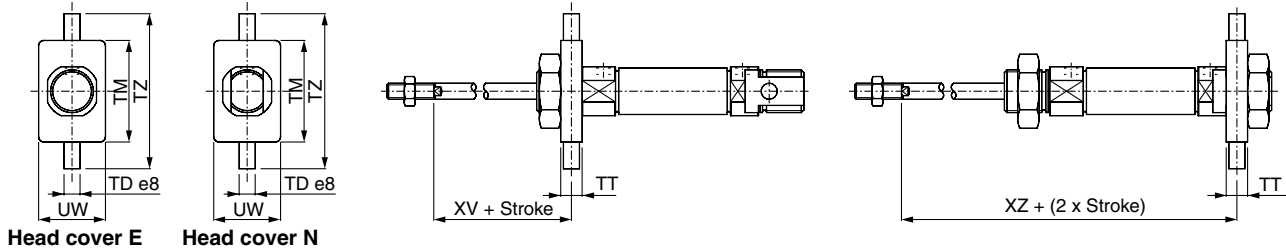
C□85N, C□85E

Rod flange, Head flange: C85F10, C85F16, C85F25



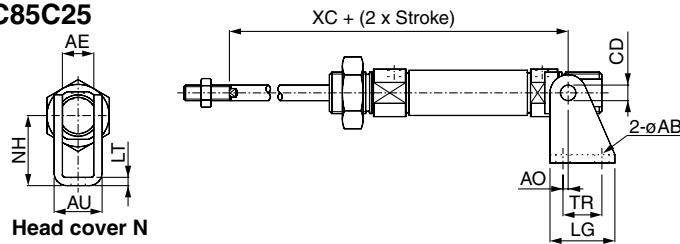
C□85N, C□85E

Rod trunnion, Head trunnion: C85T10, C85T16, C85T25



C□85N

Clevis: C85C10, C85C16, C85C25



| Bore | Front foot, Rod and head foot | | | | | | | | | | | | | | | Rod flange, Head flange | | | | | | | | | |
|------|-------------------------------|----|-----|-----|----|------------|------------|------------|------------|------------|------------|---------|------|----|----|-------------------------|----|-------|-----|----|----|------|------------|------------|------------|
| | AO | US | øAB | LT | NH | LS | | | XL | | | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | WL | | |
| | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 | | | | | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 86.5(92.5) | — | — | 91.5(97.5) | — | — | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 83.7(89.7) | — | — |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 86.5(90.5) | — | — | 91.5(95.5) | — | — | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 83.7(87.7) | — | — |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 98(101.5) | — | — | 106(109.5) | — | — | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 96(99.5) | — | — |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 103(106.5) | 129(132.5) | 155(158.5) | 111(114.5) | 137(140.5) | 163(166.5) | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 101(104.5) | 127(130.5) | 153(156.5) |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 121 | 146 | 171 | 128 | 153 | 178 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 116 | 141 | 166 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 122.5 | 147.5 | 172.5 | 133.5 | 158.5 | 183.5 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 121.5 | 146.5 | 171.5 |

| Bore | Rod trunnion, Head trunnion | | | | | | | | | Clevis | | | | | | | | | | | |
|------|-----------------------------|----|-------|----|----|----|------------|------------|------------|--------|------|-----|-----|------|------|----|----|-----|------------|------------|------------|
| | TT | UW | TD e8 | TM | TZ | XV | XZ | | | øCD H9 | AE | øAB | AO | AU | TR | LG | NH | LT | XC | | |
| | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 | | | | | | | | | | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 6 | 20 | 4 | 26 | 38 | 13 | 83.5(89.5) | — | — | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 82.5(88.5) | — | — |
| 10 | 6 | 20 | 4 | 26 | 38 | 13 | 83.5(87.5) | — | — | 4 | 8.1 | 4.5 | 1.5 | 13.1 | 12.5 | 20 | 24 | 2.5 | 82.5(86.5) | — | — |
| 12 | 8 | 25 | 6 | 38 | 58 | 18 | 96(99.5) | — | — | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 95(98.5) | — | — |
| 16 | 8 | 25 | 6 | 38 | 58 | 18 | 101(104.5) | 127(130.5) | 153(156.5) | 6 | 12.1 | 5.5 | 2 | 18.5 | 15 | 25 | 27 | 3.2 | 101(104.5) | 127(130.5) | 153(156.5) |
| 20 | 8 | 32 | 6 | 46 | 66 | 20 | 115 | 140 | 165 | 8 | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 120 | 145 | 170 |
| 25 | 8 | 32 | 6 | 46 | 66 | 24 | 120.5 | 145.5 | 170.5 | | 16.1 | 6.6 | 4 | 24.1 | 20 | 32 | 30 | 4 | 127.5 | 152.5 | 177.5 |

() : In the case of auto switch style.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

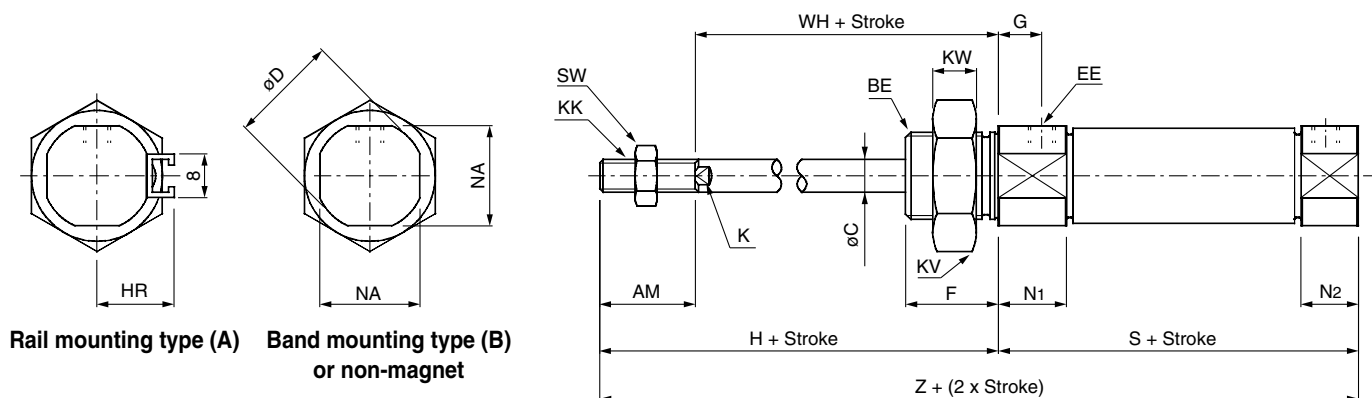
Dimensions

[First angle projection]

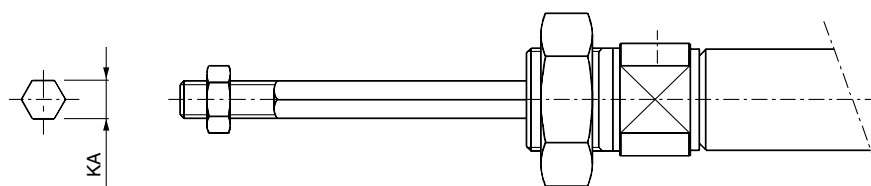
Single acting, Spring extended

C□85F□Bore□Stroke□T□

Without magnet, Built-in magnet



C85KF, CD85KF
Non-rotating (Piston rod)



Rod cross section

(mm)

| Bore | AM | BE | øC | øD | EE | F | G | H | HR | K | KA | KK | KV | KW | N1 | N2 | NA | SW | WH |
|------|----|------------|----|------|----------|----|---|----|------|---|------|------------|----|----|------|------|------|----|----|
| 8 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 28 | 10 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 7 | 16 |
| 10 | 12 | M12 x 1.25 | 4 | 16.7 | M5 x 0.8 | 12 | 7 | 28 | 10.5 | — | 4.2 | M4 x 0.7 | 19 | 6 | 11.5 | 9.5 | 15 | 7 | 16 |
| 12 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 10 | 22 |
| 16 | 16 | M16 x 1.5 | 6 | 19.7 | M5 x 0.8 | 17 | 8 | 38 | 14 | 5 | 6.2 | M6 x 1 | 24 | 8 | 12.5 | 10.5 | 18.3 | 10 | 22 |
| 20 | 20 | M22 x 1.5 | 8 | 28 | G 1/8 | 20 | 8 | 44 | 17 | 6 | 8.2 | M8 x 1.25 | 32 | 11 | 15 | 15 | 24 | 13 | 24 |
| 25 | 20 | M22 x 1.5 | 10 | 33.5 | G 1/8 | 22 | 8 | 50 | 20 | 8 | 10.2 | M10 x 1.25 | 32 | 11 | 15 | 15 | 30 | 17 | 28 |

| Bore | S | | | Z | | |
|------|------------|-----------|------------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 1 to 50 | 51 to 100 | 101 to 150 |
| 8 | 64.5(70.5) | — | — | 92.5(98.5) | — | — |
| 10 | 64.5(68.5) | — | — | 92.5(96.5) | — | — |
| 12 | 70(73.5) | — | — | 108(111.5) | — | — |
| 16 | 69(72.5) | 95(98.5) | 121(124.5) | 107(110.5) | 133(136.5) | 159(162.5) |
| 20 | 87 | 112 | 137 | 131 | 156 | 181 |
| 25 | 88.5 | 113.5 | 138.5 | 138.5 | 163.5 | 188.5 |

(): In the case of auto switch style.

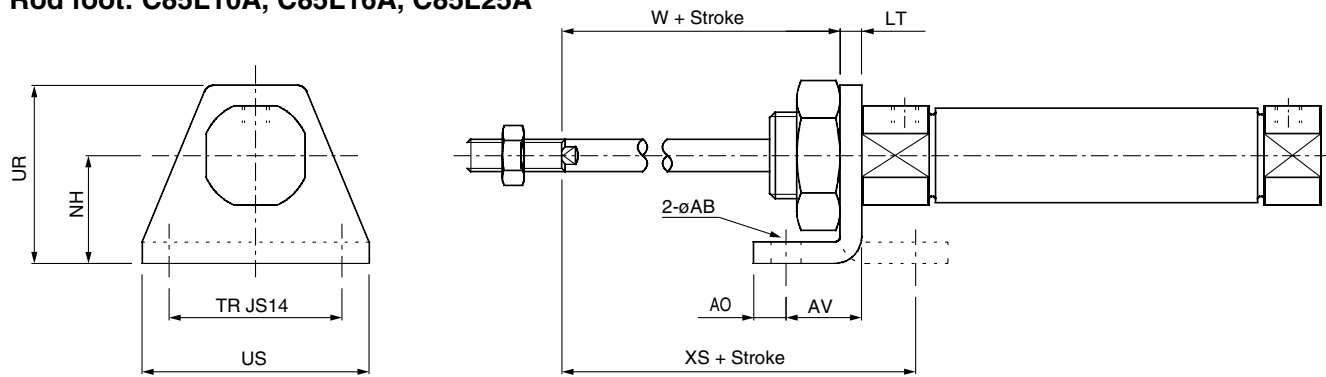
ISO Cylinder: Standard/Non-rotating Type

Single Acting, Spring Return/Extended **Series C85**

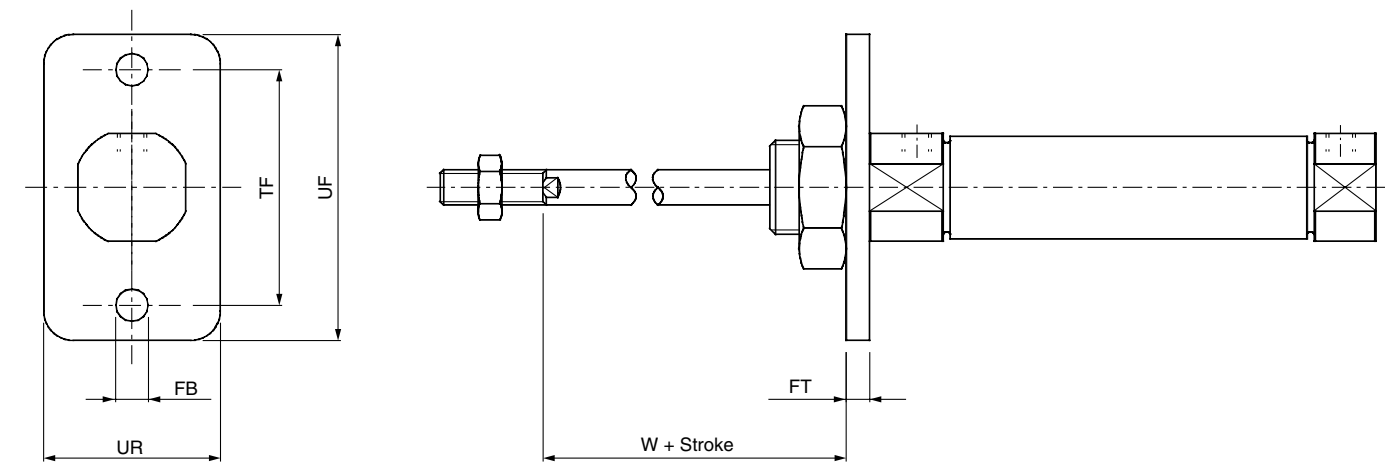
Dimensions with Mounting Bracket

[First angle projection]

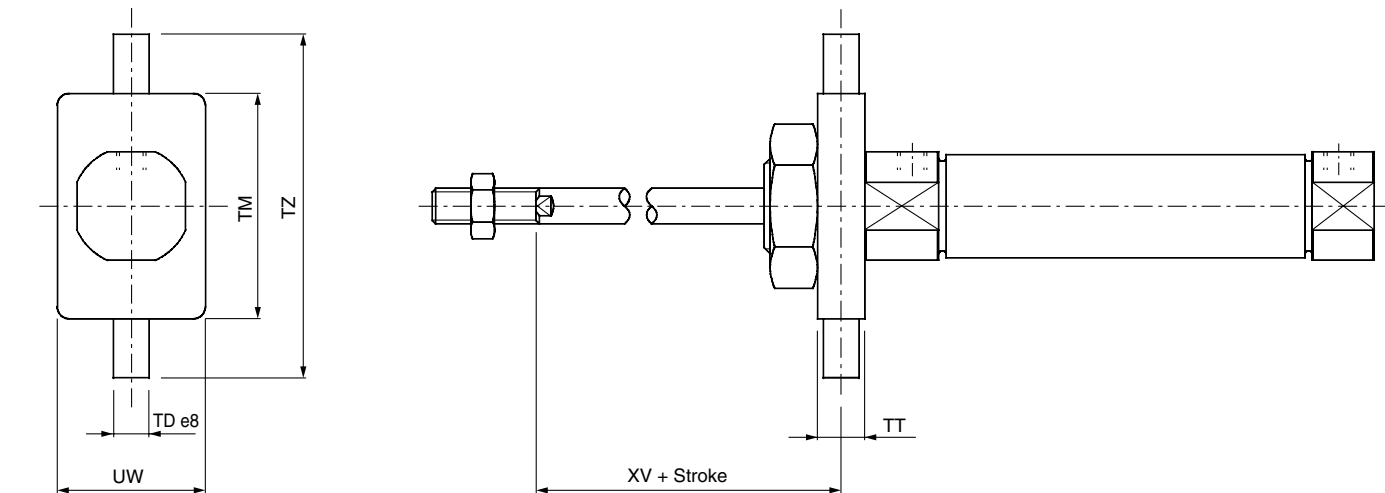
Single acting, Spring extend
Rod foot: C85L10A, C85L16A, C85L25A



Rod flange: C85F10, C85F16, C85F25



Rod trunnion: C85T10, C85T16, C85T25



| Bore | Rod foot | | | | | | | | | | Rod flange | | | | | Rod trunnion | | | | | | |
|------|----------|----|-----|-----|----|---------|------|----|----|------|------------|-------|-----|----|----|--------------|----|----|-------|----|----|----|
| | AO | US | øAB | LT | NH | TR JS14 | XS | AV | UR | W | UR | FBH13 | FT | TF | UF | W | TT | UW | TD e8 | TM | TZ | XV |
| 8 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 2.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 10 | 5 | 35 | 4.5 | 3.2 | 16 | 25 | 23.8 | 11 | 26 | 12.8 | 22 | 4.5 | 3.2 | 30 | 40 | 12.8 | 6 | 20 | 4 | 26 | 38 | 13 |
| 12 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 16 | 6 | 42 | 5.5 | 4 | 20 | 32 | 32 | 14 | 33 | 18 | 30 | 5.5 | 4 | 40 | 52 | 18 | 8 | 25 | 6 | 38 | 58 | 18 |
| 20 | 8 | 54 | 6.6 | 5 | 25 | 40 | 36 | 17 | 42 | 19 | 40 | 6.6 | 5 | 50 | 66 | 19 | 8 | 32 | 6 | 46 | 66 | 20 |
| 25 | 8 | 54 | 6.6 | 5 | 25 | 40 | 40 | 17 | 42 | 23 | 40 | 6.6 | 5 | 50 | 66 | 23 | 8 | 32 | 6 | 46 | 66 | 24 |

(mm)

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

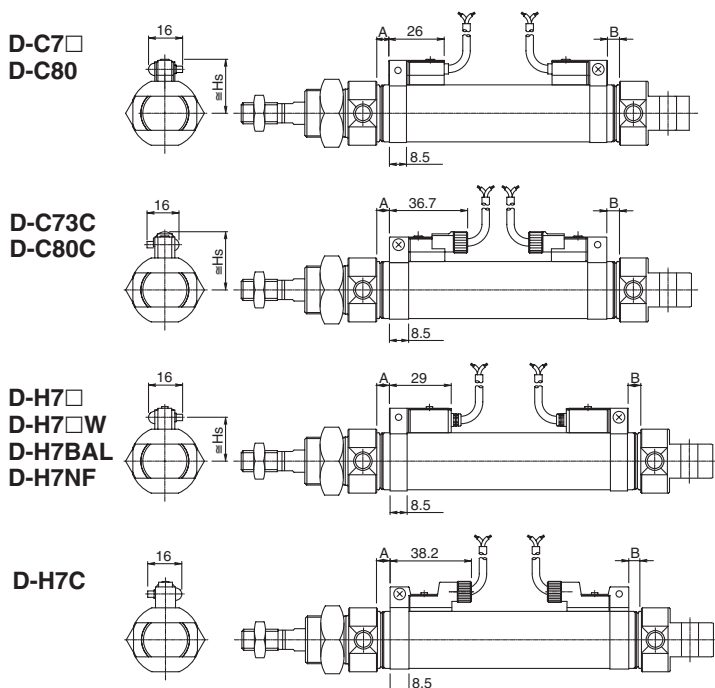
Series C85

Auto Switch Mounting Position and Mounting Height

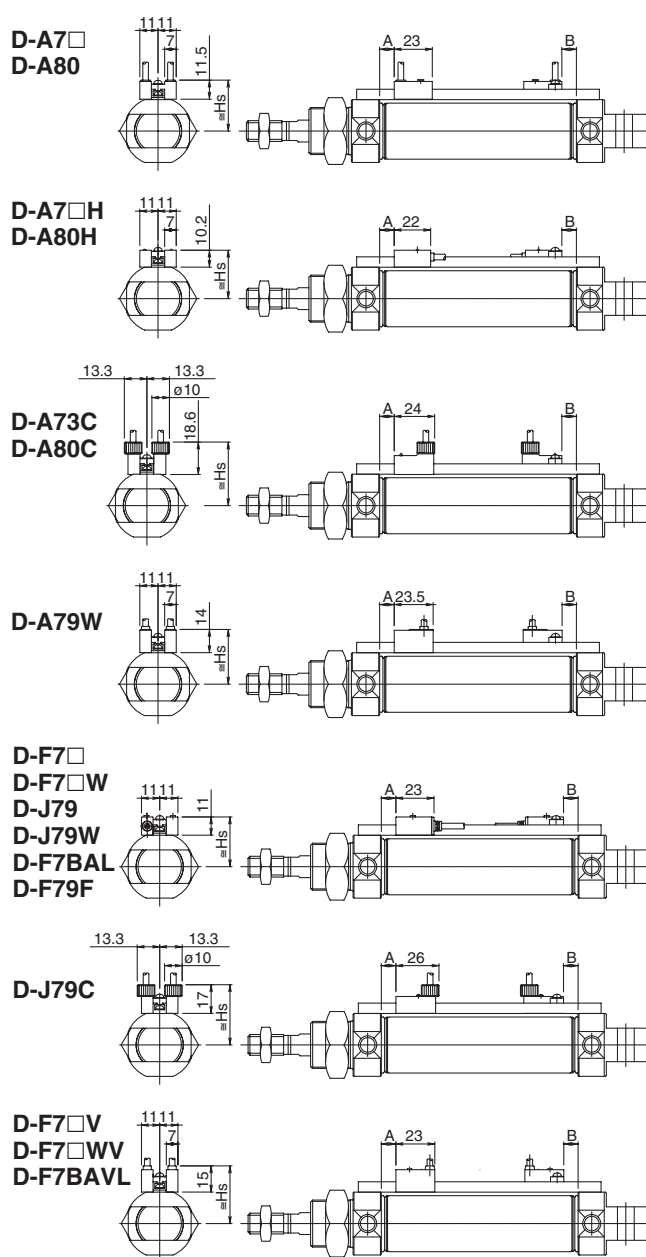
[First angle projection]

Single acting, Single return

(Band mounting type)



(Rail mounting type)



Auto Switch Mounting Position (mm)

| Auto switch model | Bore | Single acting/Spring return | | | |
|---|------|-----------------------------|--------------|---------------|------|
| | | A | | | B |
| | | 1 to 50 st | 51 to 100 st | 101 to 150 st | |
| D-C7□ D-C80 D-C73C D-C80C | 8 | 15 | 15 | 15 | 3 |
| | 10 | 13 | 13 | 13 | 3 |
| | 12 | 14.5 | 14.5 | 14.5 | 4 |
| | 16 | 14.5 | 30 | 45.5 | 10 |
| | 20 | 7(32) | 57 | 82 | 6 |
| | 25 | 7(32) | 57 | 82 | 7.5 |
| D-A73 D-A80 | 8 | 15.5 | 15.5 | 15.5 | 3.5 |
| | 10 | 13.5 | 13.5 | 13.5 | 3.5 |
| | 12 | 15 | 15 | 15 | 4.5 |
| | 16 | 15 | 30.5 | 45.5 | 10.5 |
| | 20 | 7.5(32.5) | 57.5 | 82.5 | 6.5 |
| | 25 | 7.5(32.5) | 57.5 | 82.5 | 8 |
| D-A7□H/A80H D-A73C/A80C D-F7□J79 D-F7□W/J79W D-F7□V D-F7□WV D-J79C/A72 D-F7BAL D-F79F | 8 | 16 | 16 | 16 | 4 |
| | 10 | 14 | 14 | 14 | 4 |
| | 12 | 15.5 | 15.5 | 15.5 | 5 |
| | 16 | 15.5 | 31 | 46.5 | 11 |
| | 20 | 8(33) | 58 | 83 | 7 |
| | 25 | 8(33) | 58 | 83 | 8.5 |
| D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | 8 | 14 | 14 | 14 | 2 |
| | 10 | 12 | 12 | 12 | 2 |
| | 12 | 13.5 | 13.5 | 13.5 | 3 |
| | 16 | 13.5 | 29 | 44.5 | 9 |
| | 20 | 6(31) | 56 | 81 | 5 |
| | 25 | 6(31) | 56 | 81 | 6.5 |
| D-A79W | 8 | — | — | — | — |
| | 10 | — | — | — | — |
| | 12 | — | — | — | — |
| | 16 | 12.5 | 28 | 43.5 | 8 |
| | 20 | 5(30) | 55 | 80 | 4 |
| | 25 | 5(30) | 55 | 80 | 5.5 |

- () for non rotating type.
- The lower of ø16 is a number for CD85F/Y.
- Aim at this number.

C85 Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H/A80H D-F7□J79 D-F7□W/J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C | D-F7□V D-F7□WV D-F7BAVL |
|------|---|------------------|----------------|---|------------------|-------|--------|--------|-------------------------------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 8 | 16 | 18.5 | 18 | 19 | 25 | 19 | — | 23.5 | 21.5 |
| 10 | 17 | 19.5 | 18 | 19 | 25 | 20 | — | 23.5 | 21.5 |
| 12 | 18.5 | 21 | 19.5 | 20.5 | 26.5 | 21 | 22 | 25 | 23 |
| 16 | 20.5 | 23 | 19.5 | 20.5 | 26.5 | 23 | 22 | 25 | 23 |
| 20 | 22.5 | 25 | 22.5 | 23.5 | 29.5 | 25 | 25 | 29 | 26 |
| 25 | 25 | 27.5 | 25.5 | 26.5 | 32.5 | 27.5 | 28 | 32 | 29 |

- Aim at this number.

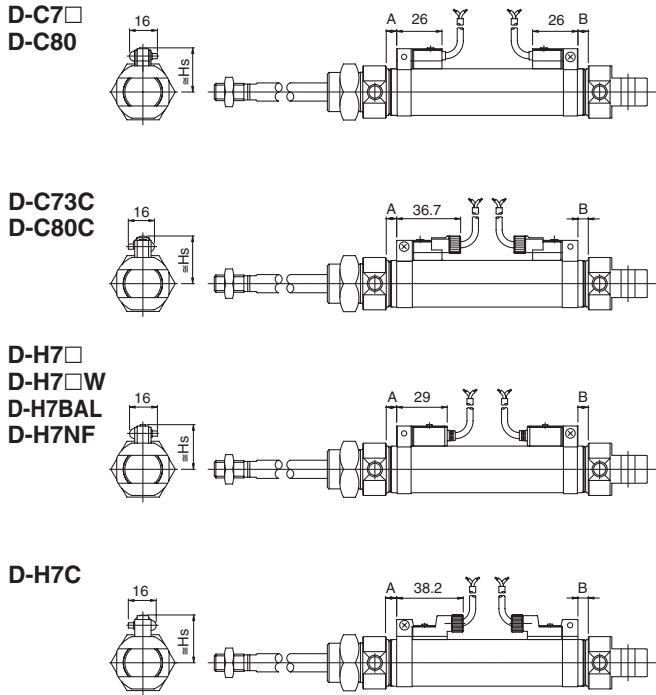
ISO Cylinder: Standard/Non-rotating Type Single Acting, Spring Return/Extended **Series C85**

Auto Switch Mounting Position and Mounting Height

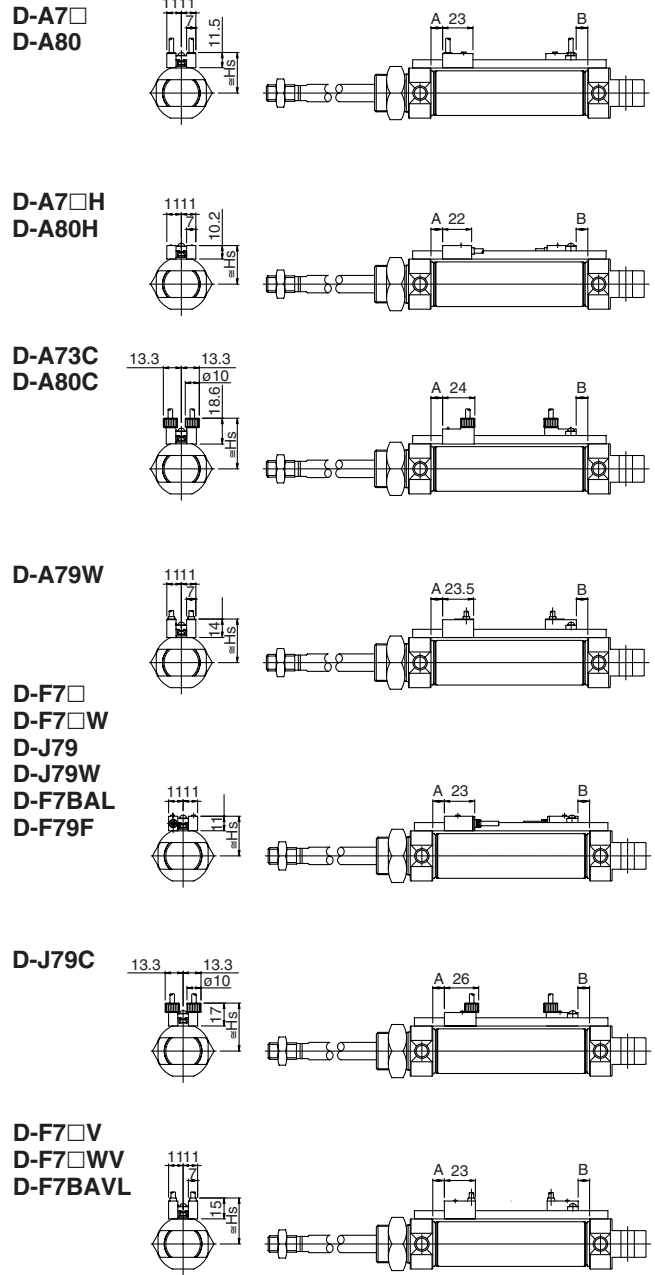
[First angle projection]

Single acting, Single Extended

(Band mounting type)



(Rail mounting type)



Auto Switch Mounting Position (mm)

| Auto switch model | Bore | Single acting/Spring extended | | | |
|--|------|-------------------------------|--------------|--------------|---------------|
| | | A | B | | |
| | | | 1 to 50 st | 51 to 100 st | 101 to 150 st |
| D-C7□ D-C80 D-C73C D-C80C | 8 | 3 | 27.5 | 27.5 | 27.5 |
| | 10 | 3 | 25.5 | 25.5 | 25.5 |
| | 12 | 4 | 27.5 | 27.5 | 27.5 |
| | 16 | 4 | 32.5 26.5 | 58.5 52.5 | 84.5 78.5 |
| | 20 | 7 | 31 | 56 | 81 |
| | 25 | 8.5 | 31 | 56 | 81 |
| D-A73 D-A80 | 8 | 3.5 | 28 | 28 | 28 |
| | 10 | 3.5 | 26 | 26 | 26 |
| | 12 | 4.5 | 28 | 28 | 28 |
| | 16 | 4.5 | 33 27 | 59 53 | 85 79 |
| | 20 | 7.5 | 31.5 | 56.5 | 81.5 |
| | 25 | 9 | 31.5 | 56.5 | 81.5 |
| D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V D-F7□WV D-J79C/A72 D-F7BAL D-F79F | 8 | 4 | 28.5 | 28.5 | 28.5 |
| | 10 | 4 | 26.5 | 26.5 | 26.5 |
| | 12 | 5 | 28.5 | 28.5 | 28.5 |
| | 16 | 5 | 33.5 27.5 | 59.5 53.5 | 85.5 79.5 |
| | 20 | 8 | 32 | 57 | 82 |
| | 25 | 9.5 | 32 | 57 | 82 |
| D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | 8 | 2 | 27.5 | 27.5 | 27.5 |
| | 10 | 2 | 25.5 | 25.5 | 25.5 |
| | 12 | 3 | 27.5 | 27.5 | 27.5 |
| | 16 | 3 | 32.5 26.5 | 58.5 52.5 | 84.5 78.5 |
| | 20 | 6 | 31 | 56 | 81 |
| | 25 | 7.5 | 31 | 56 | 81 |
| D-A79W | 8 | 1 | — | — | — |
| | 10 | 1 | — | — | — |
| | 12 | 2 | — | — | — |
| | 16 | 2 | 3.5 24.5 | 56.5 50.5 | 82.5 76.5 |
| | 20 | 5 | 29 | 54 | 79 |
| | 25 | 6.5 | 29 | 54 | 79 |

C85 Auto Switch Mounting Height

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C | D-F7□V D-F7□WV D-F7BAVL |
|------|---|------------------|----------------|--|------------------|-------|--------|--------|-------------------------------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 8 | 16 | 18.5 | 18 | 19 | 25 | 19 | — | 23.5 | 21.5 |
| 10 | 17 | 19.5 | 18 | 19 | 25 | 20 | — | 23.5 | 21.5 |
| 12 | 18.5 | 21 | 19.5 | 20.5 | 26.5 | 21 | 22 | 25 | 23 |
| 16 | 20.5 | 23 | 19.5 | 20.5 | 26.5 | 23 | 22 | 25 | 23 |
| 20 | 22.5 | 25 | 22.5 | 23.5 | 29.5 | 25 | 25 | 29 | 26 |
| 25 | 25 | 27.5 | 25.5 | 26.5 | 32.5 | 27.5 | 28 | 32 | 29 |

• Aim at this number.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

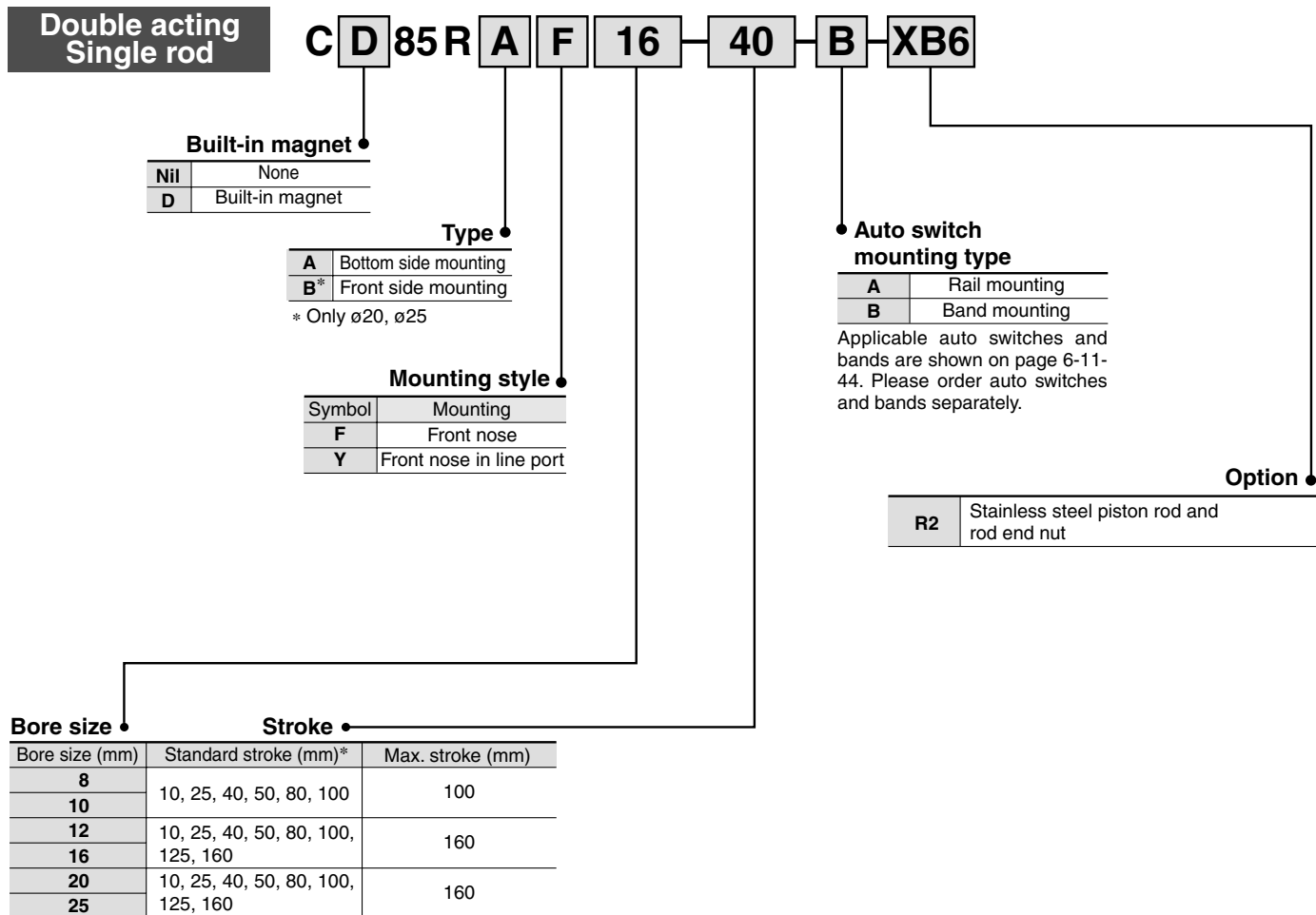
ISO Cylinder: Direct Mount Type

Double Acting, Single Rod

Series C85R

ø8, ø10, ø12, ø16, ø20, ø25

How to Order



* Other strokes on request.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | | | | | |
|----------------------|----------------|----|------------|----|------------|-------------|
| | 8 | 10 | 12 | 16 | 20 | 25 |
| Single knuckle joint | KJ4D | | KJ6D | | KJ8D | KJ10D |
| Double knuckle joint | GKM4-8 | | GKM6-10 | | GKM8-16 | GKM10-20 |
| Floating joint | JA10-4-070 | | JA15-6-100 | | JA20-8-125 | JA30-10-125 |

Replacement Parts

| Bore size (mm) | Part no. | Note |
|----------------|----------|---|
| 20 | C85-20PS | Every set includes: n°1 rod seal |
| 25 | C85-25PS | n°1 seal retaining washer n°1 retaining ring |

ISO Cylinder: Direct Mount Type Double Acting, Single Rod **Series C85R**

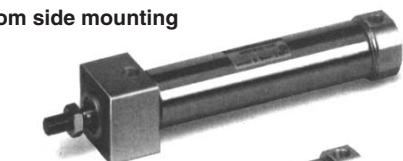
Square rod cover makes direct mounting possible

Space-saving

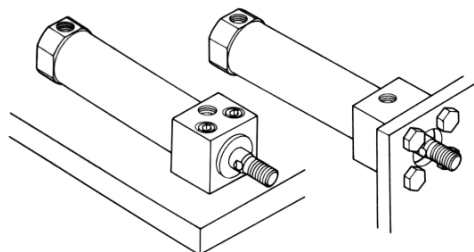
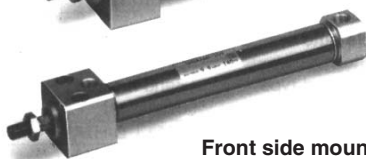
Mounting accuracy and rigidity made possible by means of faucet joint and direct mounting.

Front nose mounting type and bottom side mounting available to suit your applications.

Bottom side mounting



Front side mounting

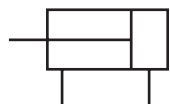


Bottom side mounting

Front side mounting

JIS Symbol

Double Acting, Single Rod



Specifications

| Bore size (mm) | 8 | 10 | 12 | 16 | 20 | 25 |
|-------------------------------|--|-----------|-----------|-----------|-----------|------------|
| Piston rod dia. (mm) | 4 | 4 | 6 | 6 | 8 | 10 |
| Piston rod thread | M4 x 0.7 | M4 x 0.7 | M6 x 1 | M6 x 1 | M8 x 1.25 | M10 x 1.25 |
| Port size | M 5 x 0.8 | M 5 x 0.8 | M 5 x 0.8 | M 5 x 0.8 | G 1/8 | G 1/8 |
| Action | Double acting, Single rod | | | | | |
| Fluid | Air | | | | | |
| Proof pressure | 1.5 MPa | | | | | |
| Max. operating pressure | 1.0 MPa | | | | | |
| Min. operating pressure | 0.1 MPa | 0.08 MPa | | 0.05 MPa | | |
| Ambient and fluid temperature | −20 to 80°C (Built-in magnet type: −10 to 60°C) | | | | | |
| Cushion | Rubber bumper (Standard) | | | | | |
| Lubrication | Not required. Use turbine oil Class 1 ISO VG32, if lubricated. | | | | | |
| Piston speed | 50 to 1500 mm/s | | | | | |
| Allowable kinetic energy | 0.02 J | 0.03 J | 0.04 J | 0.09 J | 0.27 J | 0.4 J |
| Stroke tolerance | 0/+1 | | | 0/+1.4 | | |

Weight

| Bore size (mm) | | 8 | 10 | 12 | 16 | 20 | 25 |
|--|----------------------|----|-----|-----|-----|-----|------|
| Basic weight | Bottom side mounting | 43 | 46 | 84 | 95 | 167 | 253 |
| | Front side mounting | — | — | — | — | 163 | 230 |
| Additional weight for each 10 mm of stroke | | 2 | 2.2 | 4.1 | 5.1 | 7.8 | 12.2 |

(g)

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85R

Auto Switch Mounting, Minimum Possible Cylinder Stroke

Band Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|-----------------|-----------|-------|
| | 3 pcs. | | 2 pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 55 | 90 | 15 | 50 | 10 |
| D-C73C D-C80C D-H7C | 65 | 105 | 15 | 65 | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 60 | 105 | 15 | 60 | 10 |

Rail Mounting Style

Bore size: ø8, ø10, ø12, ø16

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---------------------------------------|----------------------|--------|-------|
| | 3 pcs. | 2 pcs. | |
| | | | |
| D-A7□/A80 D-A73C/A80C | 35 | 10 | 5 |
| D-A7□H D-A80H | 45 | 10 | 5 |
| D-A79W * | 40 | 15 | 10 |
| D-F7□ D-J79 | 45 | 5 | 5 |
| D-F7□V D-J79C | 30 | 5 | 5 |
| D-F7□W D-J79W D-F7BAL D-F79F | 55 | 15 | 10 |
| D-F7□WV D-F7BAVL | 40 | 15 | 10 |

* "D-A79W" cannot be mounted on bore size ø8, ø10, ø12 cylinder.

Band Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | | | 1 pc. |
|--------------------------------------|----------------------|-----------|---|------------------|-------|
| | 2 pcs. | | n pcs. | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $50 + 45(n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $65 + 50(n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | $15 + 45(\frac{n-2}{2})$ (n = 2, 4...) | $60 + 55(n - 2)$ | 10 |

Rail Mounting Style

Bore size: ø20, ø25

(mm)

| Auto switch model | No. of auto switches | | 1 pc. |
|---|----------------------|--|-------|
| | 2 pcs. | n pcs. | |
| | | | |
| D-A7□/A80 D-A7□H/A80H D-A73C/A80C D-F7□ D-F7□V D-J79 D-J79C | 10 | $10 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 5 |
| D-A79W D-F7□W D-J79W D-F7BAL D-F79F D-F7□WV D-F7BAVL | 15 | $15 + 35\left(\frac{n-2}{2}\right)$ (n = 2, 4...) | 10 |

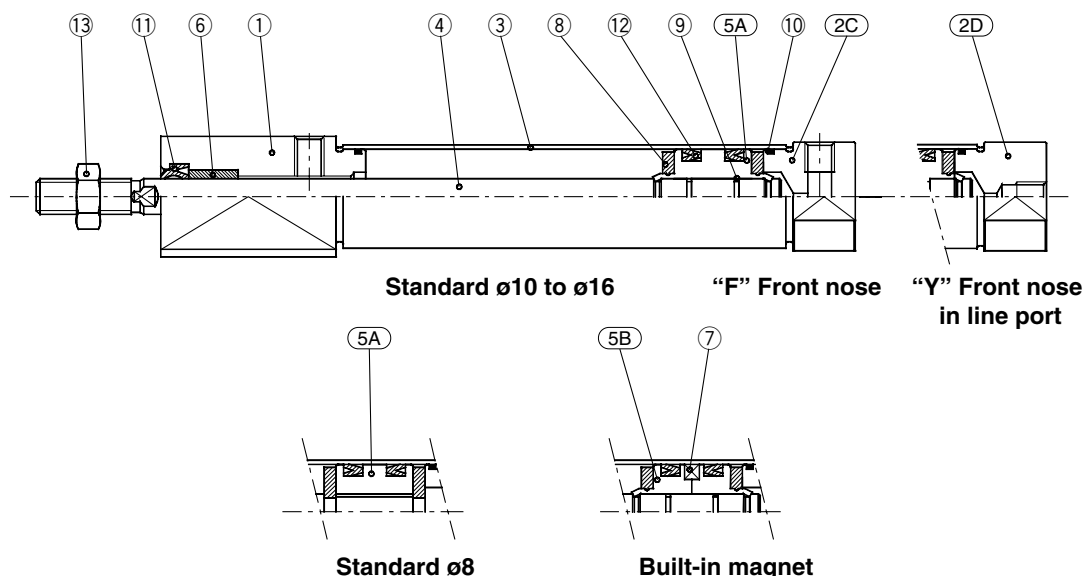
ISO Cylinder: Direct Mount Type Double Acting, Single Rod **Series C85R**

Construction

[First angle projection]

Double acting, Single rod

C□85RA8 to 16 (Disassembly is not possible.)

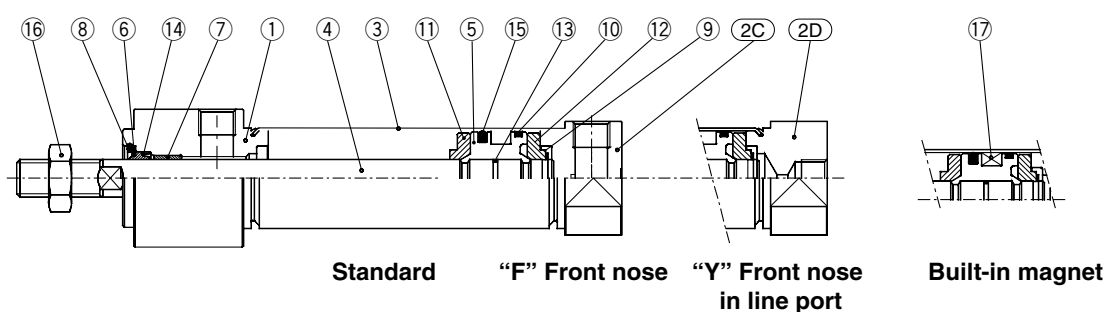


Component Parts

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|----------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Stainless steel | 1 | |
| ⑤A | Piston "A" | Brass | 1 | |
| ⑤B | Piston "B" | Brass | 2 | (Switch type piston) |

| No. | Description | Material | Qty. | Note |
|-----|---------------|-----------------|------|---------------------|
| ⑥ | Bush | Sintered bronze | 1 | |
| ⑦ | Magnet | Magnet | 1 | (Switch type only) |
| ⑧ | Bumper | Urethane | 2 | |
| ⑨ | Piston gasket | NBR | 1 | (2 for switch type) |
| ⑩ | Tube gasket | NBR | 2 | |
| ⑪ | Rod seal | NBR | 1 | |
| ⑫ | Piston seal | NBR | 2 | |
| ⑬ | Rod end nut | Carbon steel | 1 | Nickel plating |

C□85R□20/25



Component Parts

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ① | Rod cover | Aluminum alloy | 1 | White anodized |
| ②C | Head cover F | Aluminum alloy | 1 | White anodized |
| ②D | Head cover Y | Aluminum alloy | 1 | White anodized |
| ③ | Cylinder tube | Stainless steel | 1 | |
| ④ | Piston rod | Carbon steel | 1 | Hard chrome plated |
| ⑤ | Piston | Aluminum alloy | 1 | Chromate |
| ⑥ | Plain washer | Stainless steel | 1 | |
| ⑦ | Bush | Sintered bronze | 1 | |
| ⑧ | Retaining ring | Carbon steel | 1 | Nickel plating |

| No. | Description | Material | Qty. | Note |
|-----|----------------|-----------------|------|--------------------|
| ⑨ | Retaining ring | Stainless steel | 1 | |
| ⑩ | Wear ring | Resin | 1 | |
| ⑪ | Bumper A | Urethane | 1 | |
| ⑫ | Bumper B | Urethane | 1 | |
| ⑬ | Piston gasket | NBR | 1 | |
| ⑭ | Rod seal | NBR | 1 | |
| ⑮ | Piston seal | NBR | 1 | |
| ⑯ | Rod end nut | Carbon steel | 1 | Nickel plating |
| ⑰ | Magnet | Magnet | 1 | (Switch type only) |

Series C85R

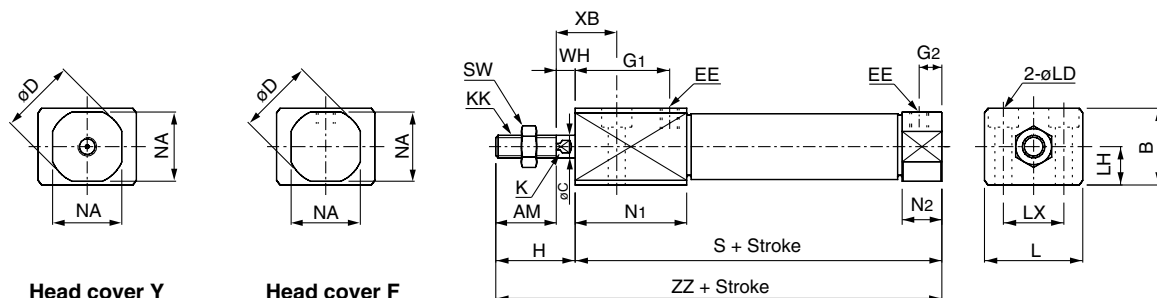
Dimensions

[First angle projection]

Double acting, Single rod

Base mounting/C□85RA^F 8 to 16 — Stroke — B

Without magnet, Built-in magnet (Band mounting type)

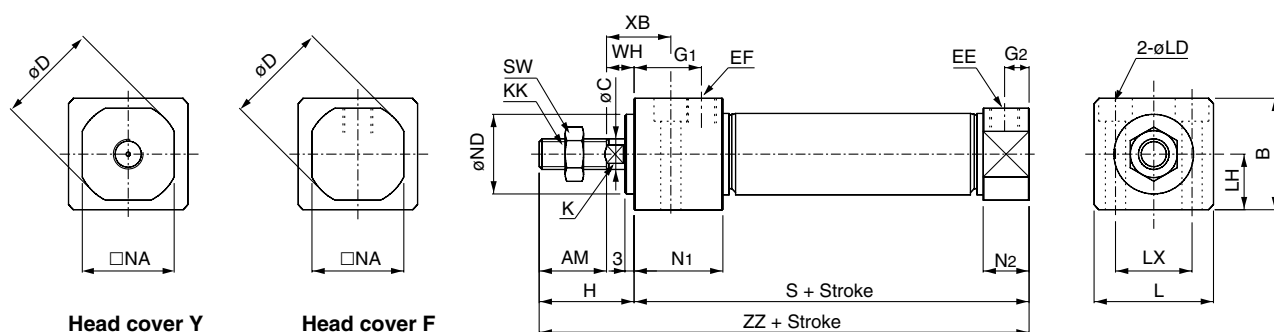


(mm)

| Bore | AM | B | øC | øD | EE | G1 | G2 | H | K | KK | L | øLD | LH | LX | N1 | N2 | NA | S | SW | WH | XB | ZZ |
|------|----|----|----|----|----------|----|----|----|---|----------|----|-----------------------------------|----|----|------|------|------|----|----|----|----|----|
| 8 | 12 | 16 | 4 | 17 | M5 x 0.8 | 19 | 5 | 16 | — | M4 x 0.7 | 23 | ø3.5, ø6.5 depth of counterbore 4 | 8 | 14 | 23.5 | 9.5 | 15 | 58 | 7 | 4 | 12 | 74 |
| 10 | 12 | 16 | 4 | 17 | M5 x 0.8 | 19 | 5 | 16 | — | M4 x 0.7 | 23 | ø3.5, ø6.5 depth of counterbore 4 | 8 | 14 | 23.5 | 9.5 | 15 | 58 | 7 | 4 | 12 | 74 |
| 12 | 16 | 20 | 6 | 20 | M5 x 0.8 | 25 | 6 | 21 | 5 | M6 x 1 | 26 | ø4.5, ø8 depth of counterbore 5 | 10 | 16 | 29.5 | 10.5 | 18.3 | 67 | 10 | 5 | 16 | 88 |
| 16 | 16 | 20 | 6 | 20 | M5 x 0.8 | 25 | 6 | 21 | 5 | M6 x 1 | 26 | ø4.5, ø8 depth of counterbore 5 | 10 | 16 | 29.5 | 10.5 | 18.3 | 67 | 10 | 5 | 16 | 88 |

Base mounting/C□85RA^F 20/25 — Stroke — B

Without magnet, Built-in magnet (Band mounting type)

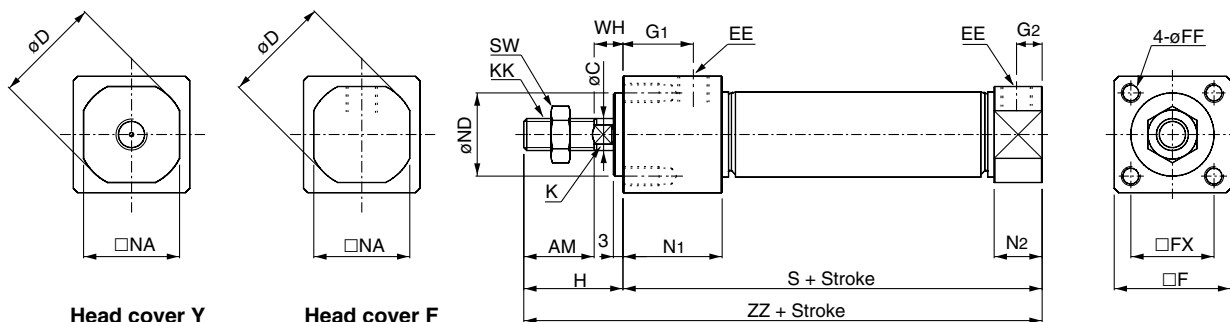


(mm)

| Bore | AM | B | øC | øD | EE | G1 | G2 | H | K | KK | L | øLD | LH | LX | N1 | N2 | □NA | øND h8 | S | SW | WH | XB | ZZ |
|------|----|------|----|------|-------|----|----|----|---|------------|------|-------------------------------------|----|----|----|----|-----|-----------------------------------|----|----|----|----|-----|
| 20 | 20 | 30.3 | 8 | 28 | G 1/8 | 22 | 8 | 30 | 6 | M8 x 1.25 | 33.5 | ø5.5, ø9.5 depth of counterbore 6.5 | 15 | 21 | 29 | 15 | 24 | 20 ⁰ _{-0.033} | 76 | 13 | 10 | 22 | 106 |
| 25 | 22 | 36.6 | 10 | 33.5 | G 1/8 | 22 | 8 | 36 | 8 | M10 x 1.25 | 39 | ø6.6, ø11 depth of counterbore 7.5 | 18 | 25 | 29 | 15 | 30 | 26 ⁰ _{-0.033} | 79 | 17 | 14 | 26 | 115 |

Front mounting/C□85RB^F 20/25 — Stroke — B

Without magnet, Built-in magnet (Band mounting type)



(mm)

| Bore | AM | øC | øD | EE | □F | FF | □FX | G1 | G2 | H | K | KK | N1 | N2 | □NA | øND h8 | S | SW | WH | ZZ |
|------|----|----|------|-------|------|------------------|-----|----|----|----|---|------------|----|----|-----|-----------------------------------|----|----|----|-----|
| 20 | 20 | 8 | 28 | G 1/8 | 30.4 | M5 x 0.8 depth 9 | 22 | 22 | 8 | 30 | 6 | M8 x 1.25 | 29 | 15 | 24 | 20 ⁰ _{-0.033} | 76 | 13 | 10 | 106 |
| 25 | 22 | 10 | 33.5 | G 1/8 | 36.4 | M6 x 1 depth 11 | 26 | 22 | 8 | 36 | 8 | M10 x 1.25 | 29 | 15 | 30 | 26 ⁰ _{-0.033} | 79 | 17 | 14 | 115 |

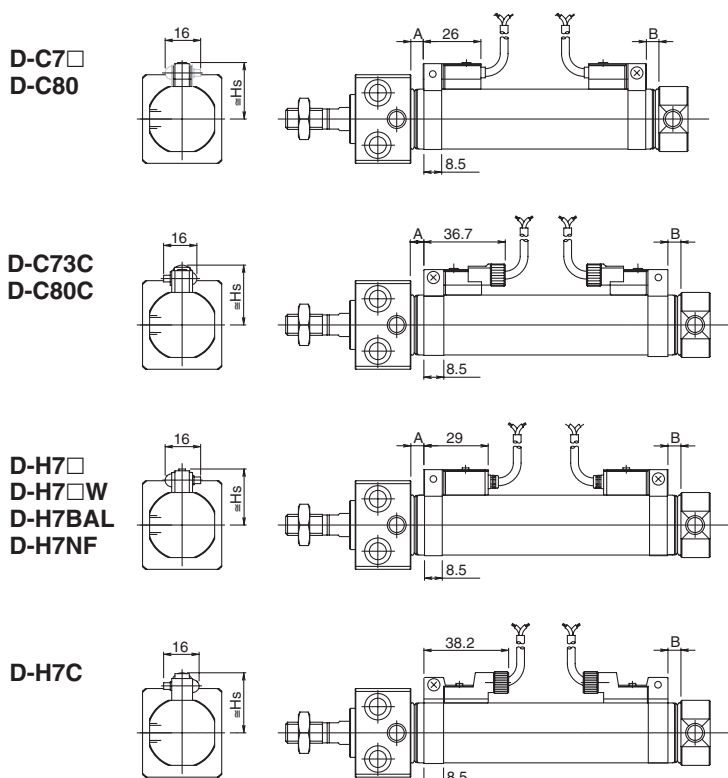
ISO Cylinder: Direct Mount Type Double Acting, Single Rod **Series C85R**

Auto Switch Mounting Position and Mounting Height

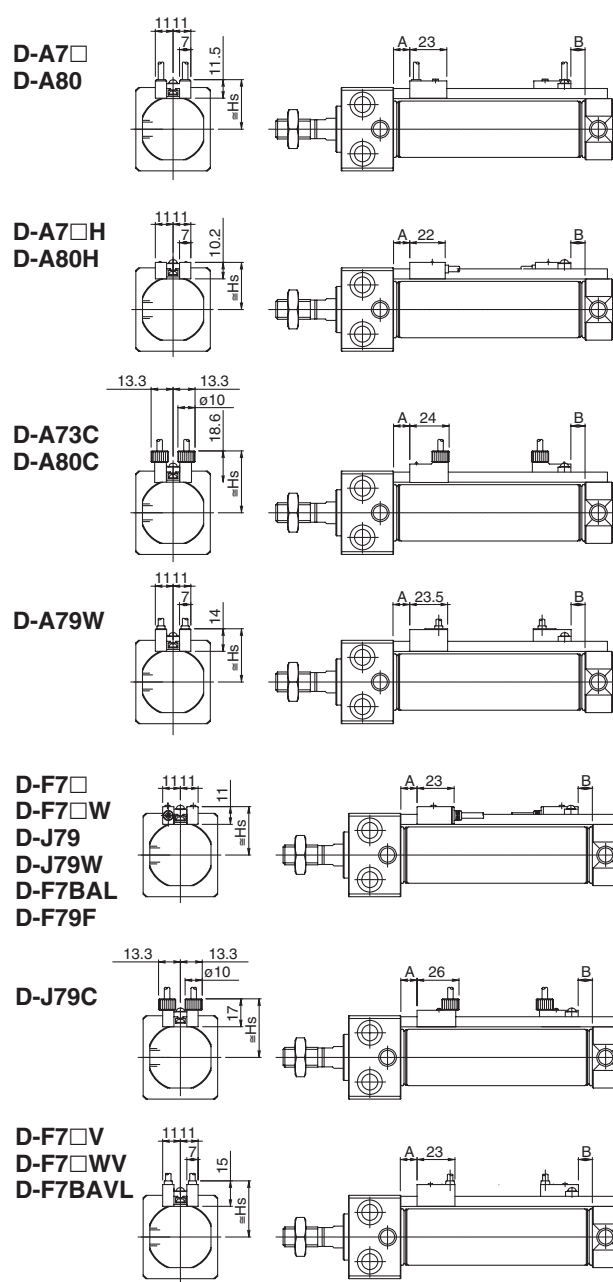
[First angle projection]

Double acting, Single rod

(Band mounting type)



(Rail mounting type)



Auto Switch Mounting Position

(mm)

| Bore | D-C7□ D-C80 D-C73C D-C80C | | D-A73 D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V D-F7□WV D-J79C/A72 D-F7BAL D-F79F | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | | D-A79W | |
|------|------------------------------------|-----|----------------|-----|--|-----|---|-----|--------|-----|
| | A | B | A | B | A | B | A | B | A | B |
| 8 | 3 | 3 | 3.5 | 3.5 | 4 | 4 | 2 | 2 | — | — |
| 10 | 3 | 3 | 3.5 | 3.5 | 4 | 4 | 2 | 2 | — | — |
| 12 | 4 | 4 | 4.5 | 4.5 | 5 | 5 | 3 | 3 | — | — |
| 16 | 4 | 4 | 4.5 | 4.5 | 5 | 5 | 3 | 3 | 2 | 2 |
| 20 | 7 | 6 | 7.5 | 6.5 | 8 | 7 | 6 | 5 | 5 | 4 |
| 25 | 8.5 | 7.5 | 9 | 8 | 9.5 | 8.5 | 7.5 | 6.5 | 6.5 | 5.5 |

C85 Auto Switch Mounting Height

(mm)

| Bore | D-C7□/C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL D-F79F | D-A73C D-A80C | D-H7C | D-A79W | D-J79C | D-F7□V D-F7□WV D-F7BAVL |
|------|---|------------------|----------------|--|------------------|-------|--------|--------|-------------------------------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 8 | 16 | 18.5 | 18 | 19 | 25 | 19 | — | 23.5 | 21.5 |
| 10 | 17 | 19.5 | 18 | 19 | 25 | 20 | — | 23.5 | 21.5 |
| 12 | 18.5 | 21 | 19.5 | 20.5 | 26.5 | 21 | — | 25 | 23 |
| 16 | 20.5 | 23 | 19.5 | 20.5 | 26.5 | 23 | 22 | 25 | 23 |
| 20 | 22.5 | 25 | 22.5 | 23.5 | 29.5 | 25 | 25 | 29 | 26 |
| 25 | 25 | 27.5 | 25.5 | 26.5 | 32.5 | 27.5 | 28 | 32 | 29 |

• Aim at this number.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

Applicable Auto Switch

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | | Auto switch model** | | | Lead wire length* (mm) | | | | Applicable load | | | |
|--------------------|---------------------------------|------------------|-----------------|----------------------------------|--------------|-----------|---------------|---------------------|--------------|-----------|------------------------|-------|------------|------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | Band mounting | Rail mounting | | 0.5 (—) | 3 (L) | 5 (Z) | None (N) | | | | | |
| | | | | | | | | Perpendicular | In-line | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | Relay, PLC | | |
| | | | | 2-wire | — | — | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | |
| | | | Connector | | No | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | |
| | | Yes | | | 5 V, 12 V | ≤ 100 V | C80 | A80 | A80H | ● | ● | — | — | IC circuit | | | | |
| | | No | | | 12 V | — | C73C | A73C | — | ● | ● | ● | ● | — | | | | |
| | Yes | 5 V, 12 V | | | ≤ 24 V | C80C | A80C | — | ● | ● | ● | ● | IC circuit | | | | | |
| | Diagnostic indication (2-color) | Grommet | Yes | | — | — | — | A79W | — | ● | ● | — | — | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | IC circuit | Relay, PLC | | |
| | | | | 3-wire (PNP) | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | — | | | |
| | | Connector | | 2-wire | | 12 V | | — | H7B | F7BV | J79 | ● | ● | ○ | — | | — | |
| | Diagnostic indication (2-color) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | — | H7NW | F7NWV | F79W | ● | ● | ○ | — | | IC circuit | |
| | | | | 3-wire (PNP) | | | | | H7PW | — | F7PW | ● | ● | ○ | — | | — | |
| | | | | 2-wire | | | | | 12 V | H7BW | F7BWV | J79W | — | ● | ○ | | — | — |
| | | | | | | | | | | H7BA | F7BAV | F7BA | — | ● | ○ | | — | — |
| | | | | With timer | | | | | 3-wire (NPN) | 5 V, 12 V | — | F7NT | ● | ● | ○ | | — | — |
| | | | | With diagnostic output (2-color) | | | | | 4-wire (NPN) | H7NF | — | F79F | ● | ● | ○ | | — | IC circuit |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 5 m Z (Example) C73CZ
 3 m L (Example) C73CL
 None N (Example) C73CN

* Solid state switches marked with "○" are manufactured upon receipt of order.

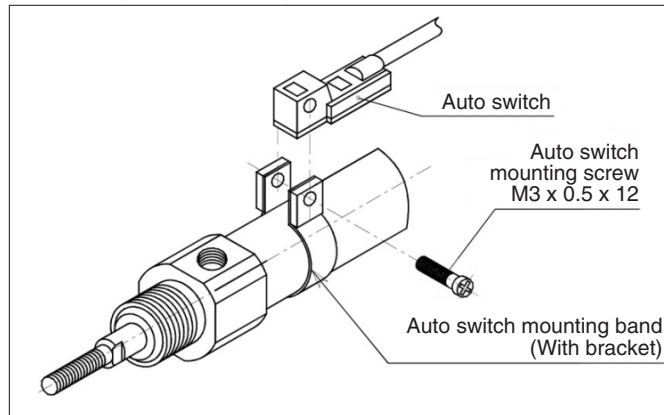
** "D-A79W" cannot be mounted on bore size ø8, ø10, ø12 cylinder.

Mounting Bracket Band mounting type

<Applicable auto switch>

D-C7□/C80, D-C73C/C80C, D-H7□, D-H7C

Mounting and Moving Method of Auto Switch



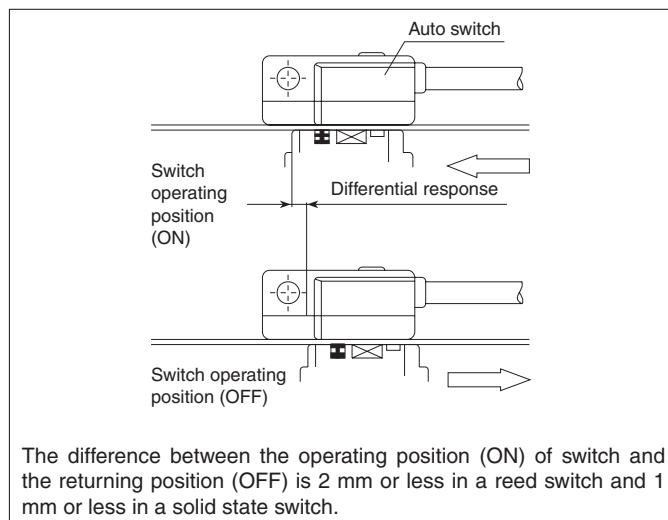
1. Put a mounting band on the cylinder tube and position the auto switch.
2. Put the mounting part of auto switch in the middle of the stationary fitting, aligning the mounting hole with the hole of the stationary fitting.
3. Screw in the auto switch mounting screw through the mounting hole into the threaded part of the band fitting.
4. Set the whole body to the detecting position by sliding, then tighten the mounting screw to fix the auto switch (the tightening torque of M3 screw should be about 80 to 100 N/cm).
5. Modification of the detecting position should be made following step #3.

Auto Switch Mounting Band Part No.

| Series | Bore size (mm) | | | | | |
|--------|----------------|---------|---------|---------|---------|---------|
| | 8 | 10 | 12 | 16 | 20 | 25 |
| C85 | BJ2-008 | BJ2-010 | BJ2-012 | BJ2-016 | BM2-020 | BM2-025 |

Differential Response of Auto Switch

The distance from the operating position of auto switch to the returning position is called the differential response. This response is included in part of the operating range (one side).



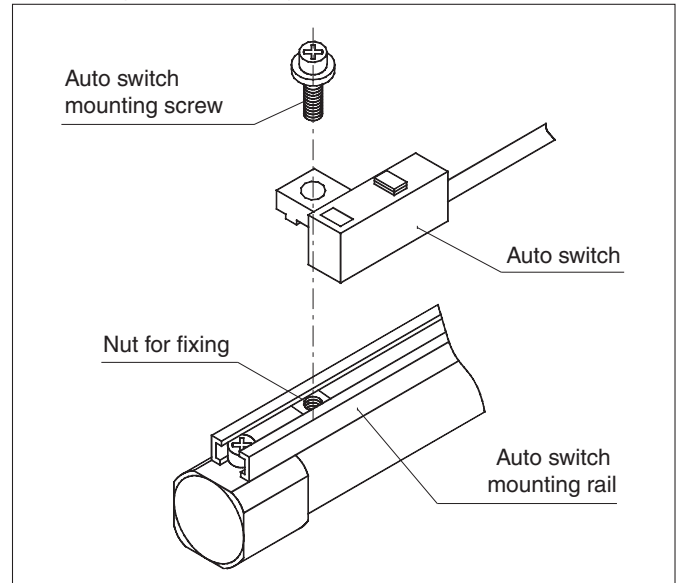
The difference between the operating position (ON) of switch and the returning position (OFF) is 2 mm or less in a reed switch and 1 mm or less in a solid state switch.

Mounting Bracket Rail mounting type

<Applicable auto switch>

D-A7□/A80, D-A73C/A80C, D-F7□/J7□, D-J79C

Mounting and Moving Method of Auto Switch



1. Slide the nut located inside the mounting rail and set it at the auto switch mounting position.
2. Fit the convex part of the auto switch mounting arm into the slot of the rail and slide it to the nut position.
3. Allow the auto switch mounting screw to match gently in the nut for attachment and screw it in.
4. Check the detecting position again and tighten the mounting screw to fix the auto switch definitely (the tightening torque of M3 screw should be about 50 to 70 N/cm).
5. Modification of the detecting position should be made following step #3.

Maximum Piston Speed

If an auto switch is set at mid-stroke, the electrical device to which it is connected, may not operate if piston speed is too high. Maximum allowable piston speed "V" is given by

$$V \text{ (mm/s)} = \frac{\text{Operating range of auto switch (mm)}}{\text{Response time of electrical device (ms)}} \times 1000$$

Example

The operating range of a D-A73L reed switch on a CD85E40 cylinder is 8 mm. It is necessary to use a solenoid valve with an electrical response time of 30 ms.

$$\text{Maximum piston speed, } V = \frac{8}{30} \times 1000 = 266 \text{ mm/s}$$

Operating Range of Auto Switch

| Mounting | Model | Bore size (mm) | | | | | |
|----------|-----------------------|----------------|----|----|----|------|------|
| | | 8 | 10 | 12 | 16 | 20 | 25 |
| Band | D-C7□/C80/C73C/C80C | 7 | 7 | 7 | 7 | 7 | 8 |
| | D-H7□/H7□W/H7BAL | 3 | 3 | 3 | 4 | 4 | 4 |
| | D-H7C | 8 | 8 | 8 | 9 | 7 | 8.5 |
| | D-A7□/A80, D-A7□H/A80 | 8 | 8 | 9 | 9 | 7 | 7 |
| Rail | D-A73C/A80C | — | — | — | 13 | 10.5 | 10.5 |
| | D-A79W | — | — | — | 13 | 10.5 | 10.5 |
| | D-F7□/J79/F7□W/J79W | — | — | — | 13 | 10.5 | 10.5 |
| | D-F7□V/F7□WV/F79F | 5 | 5 | 6 | 6 | 5 | 6 |
| | D-J79C/F7BA□ | — | — | — | 13 | 10.5 | 10.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C85

Contact Protective Box CD-P11, CD-P12

D-A7/A8 and D-C7/C8 reed switches do not incorporate contact protection circuits. Contact protection is required if:

1. Operating load is inductive.
2. The wiring length to load is 5 m or more.
3. Load voltage is 100 VAC or more.

Contact Protective Box/Specifications

| Part no. | CD-P11 | | CD-P12 |
|-------------------|---------|---------|--------|
| Load voltage | 100 VAC | 200 VAC | 24 VDC |
| Max. load current | 25 mA | 12.5 mA | 50 mA |

Lead wire length Switch connecting side 0.5 m
Load connecting side 0.5 m

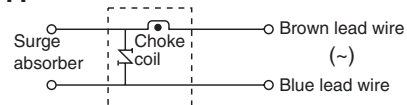


Connection Method of Contact Protector

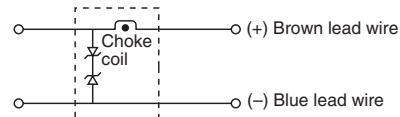
Connect lead wires from reed switch to those on protector box indicated with "switch". Length of lead between switch body and protector should be less than 1 m.

Contact Protective Box/Internal Circuit

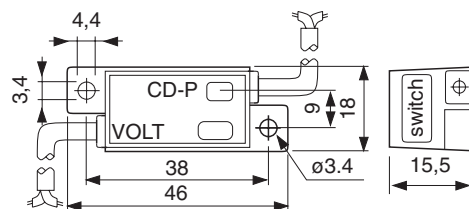
CD-P11



CD-P12



Contact Protective Box/Dimensions



1 High Temperature XB6

C85 Mounting Bore size – Stroke – XB6

N, E, F, Y 8, 10, 12, 16, 20, 25 mm

Standard cylinder seals are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a high ambient temperature (–10 to 150°C).

Possible applications:

- Bore size 8 to 20 mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at high temperature.)
- Single rod — Double acting
- Double rod — Double acting (W)

Dimensions unchanged

Specifications

| | |
|---------------------------|--|
| Type | Air cylinder |
| Applicable size | ø8, ø10, ø16, ø20, ø25 mm |
| Action | Double acting |
| Ambient temperature range | –10 to 150°C |
| Piston speed | 50 to 500 mm/s |
| Cushion | Rubber bumper |
| Material | Seal: Fluorocarbon rubber Wear ring: Fluorocarbon resin |
| Grease | Fluorinated grease |

Note) Contact SMC for non-rotating type.

3 Low Speed XB9

C85 Mounting Bore size – Stroke – XB9

N, E, F, Y 20, 25 mm

The cylinder does not generate any stick-slip phenomenon even at the rated low speed of 10 to 50 mm/s.

All strokes drive at a constant speed smoothly.

Possible applications:

- Bore size 20 and 25 mm
- Rubber bumper type only
- With or without magnets
- Single rod — Double acting

Dimensions unchanged

Specifications

| | |
|-----------------|---------------|
| Type | Air cylinder |
| Applicable size | ø20, ø25 mm |
| Action | Double acting |
| Piston speed | 10 to 50 mm/s |
| Cushion | Rubber bumper |

Note) Contact SMC for non-rotating type.

2 Low Temperature XB7

C85 Mounting Bore size – Stroke – XB7

N, E, F, Y 20, 25 mm

Standard cylinder packing are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a low ambient temperature (–55 to 70°C).

Possible applications:

- Bore size 20 and 25 mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at low temperature.)
- Single rod — Double acting
- Double rod — Double acting (W)

Dimensions unchanged

Specifications

| | |
|---------------------------|---|
| Type | Air cylinder |
| Applicable size | ø20, ø25 mm |
| Action | Double acting |
| Ambient temperature range | –55 to 70°C |
| Cushion | Rubber bumper |
| Material | Seal: Low nitrile rubber Wear ring: Fluorocarbon resin |
| Grease | Fluorinated grease |

Note) Contact SMC for non-rotating type.

4 Heavy-duty Scraper XC4

C85 Mounting Bore size – Stroke – XC4

N, E, F, Y 20, 25 mm

A heavy-duty scraper is used as wiper ring. Ideal for severe applications where the cylinder is exposed to dust, earth and sand. Applicable to casting machines, construction machines, industrial vehicles, etc.

Possible applications:

- Bore size 20 and 25 mm
- Rubber bumper type only
- With or without magnets
- Single rod — Double acting
- Double rod — Double acting (W)

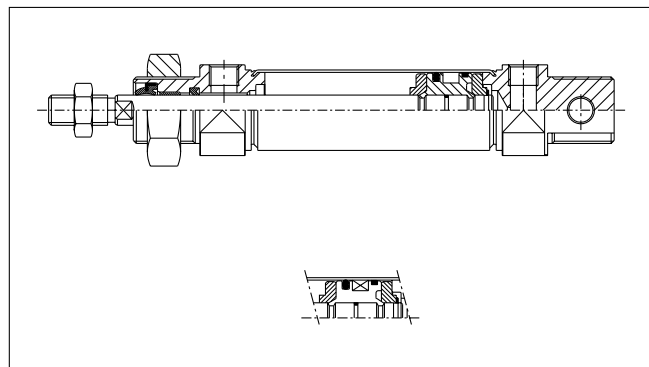
Dimensions unchanged

Specifications

| | |
|-------------------------|--------------------|
| Type | Air cylinder |
| Applicable size | ø20, ø25 mm |
| Max. operating pressure | 1 MPa (10 bar) |
| Min. operating pressure | 0.08 MPa (0.8 bar) |
| Cushion | Rubber bumper |
| Wiper ring | NBR (SCB) |

Note) Not applicable for non-rotating type.

Construction



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data




Air Cylinder

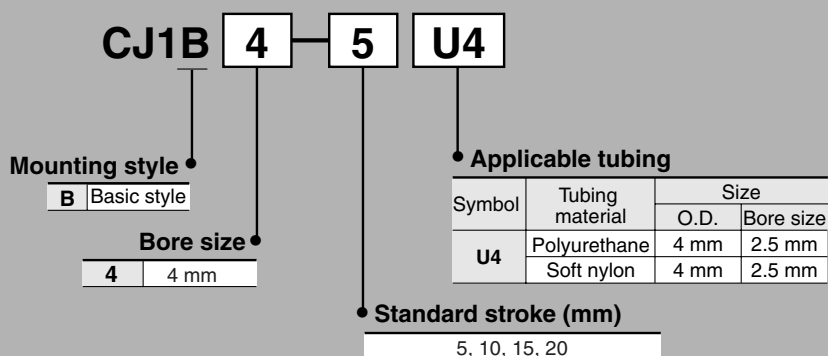
Series CJ1

Double Acting: ø4/Single Acting, Spring Return: ø2.5, ø4

Series Variations

| Series | Action | | Bore size (mm) | Cylinder standard stroke (mm) | Page |
|---|---------------|--------------------------|----------------|-------------------------------|-------|
| Standard Series CJ1  | Double acting | Single rod | 4 | 5, 10, 15, 20 | 6-2-2 |
| | Single acting | Single rod Spring return | 2.5 4 | 5, 10 5, 10, 15, 20 | 6-2-4 |

How to Order/Double Acting



For single acting type, refer to pages 6-2-4 to 5.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

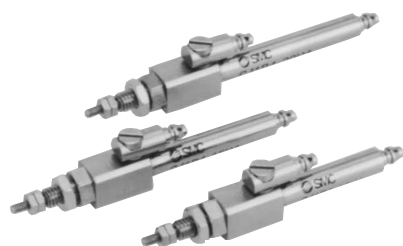
Data

Air Cylinder

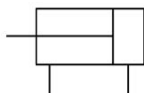
Double Acting, Single Rod

Series CJ1

ø4



JIS Symbol
Double acting,
Single rod



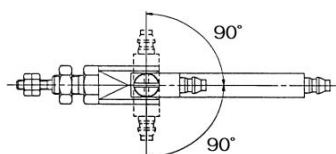
Formation of small series of a double acting cylinder

(A cylinder with ø4 bore has been added as a compact type to the existing CJ2: ø6 double acting cylinder.)

The fitting on the rod cover side has been provided with a variable piping direction.

(The piping direction of the fitting on the rod cover side can move freely within a range of $\pm 90^\circ$.)

■ **The piping direction of the fitting on the rod cover side varies within a range of $\pm 90^\circ$.**



⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Piping

⚠ Caution

1. Do not force to connect piping in such a way that the lateral force could be applied on a cylinder tube. Because this could cause a cylinder tube to slant and malfunction.

Mounting

⚠ Caution

1. Do not install by directly grasping the cylinder tube, as this could cause a tube to deform and malfunction.
2. Do not install it by directly grasping the piston rod with a pair of electrician's pliers. Because scratches on the piston rod would cause a bearing or rod seal to get damaged, malfunction, and leak air.

Specifications

| | |
|-------------------------------|---------------------------|
| Action | Double acting, Single rod |
| Fluid | Air |
| Proof pressure | 1.05 MPa |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.2 MPa |
| Ambient and fluid temperature | -10 to 70°C (No freezing) |
| Piston speed | 50 to 500 mm/s |
| Cushion | None |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | $+0.5$ 0 mm |
| Mounting | Basic style |
| Lubrication | Not required (Non-lube) |

Model/Bore Size/Standard Stroke

| Model | Bore size (mm) | Standard stroke (mm) |
|--------------|----------------|----------------------|
| CJ1B4 | 4 | 5, 10, 15, 20 |

Applicable Tubing

| Tubing type | Material | Size | | Tube no. |
|-------------|--------------|------|-----------|----------|
| | | O.D. | Bore size | |
| Metric size | Polyurethane | 4 mm | 2.5 mm | TU0425 |
| | Soft nylon | 4 mm | 2.5 mm | TS0425 |

Theoretical Output

(N)

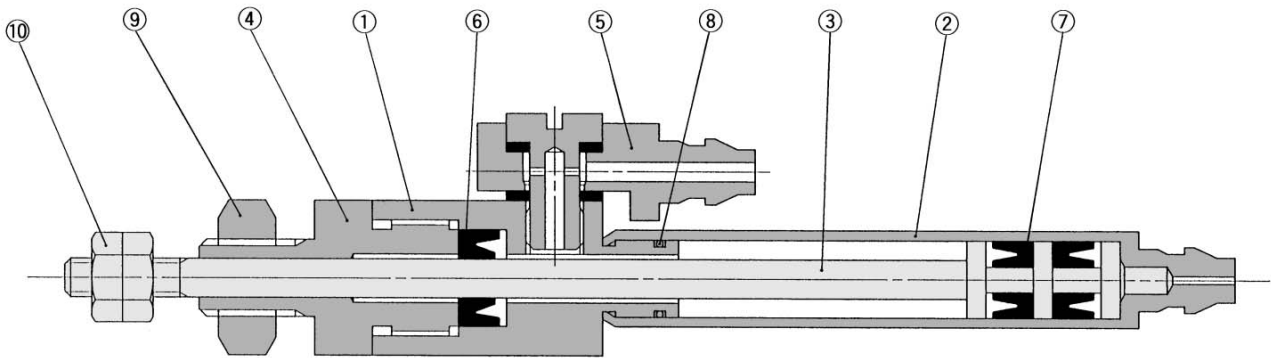
| Bore size (mm) | Rod size (mm) | Action | Piston area (mm ²) | Operating pressure (MPa) | | | | | |
|----------------|---------------|--------|--------------------------------|--------------------------|------|------|------|------|------|
| | | | | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 4 | 2 | OUT | 12.6 | 2.52 | 3.78 | 5.04 | 6.30 | 7.56 | 8.82 |
| | | IN | 9.4 | 1.88 | 2.82 | 3.76 | 4.70 | 5.64 | 6.58 |

Weight

(g)

| Bore size (mm) | Cylinder stroke (mm) | Weight |
|----------------|----------------------|--------|
| 4 | 5 | 12.0 |
| | 10 | 12.4 |
| | 15 | 12.8 |
| | 20 | 13.2 |

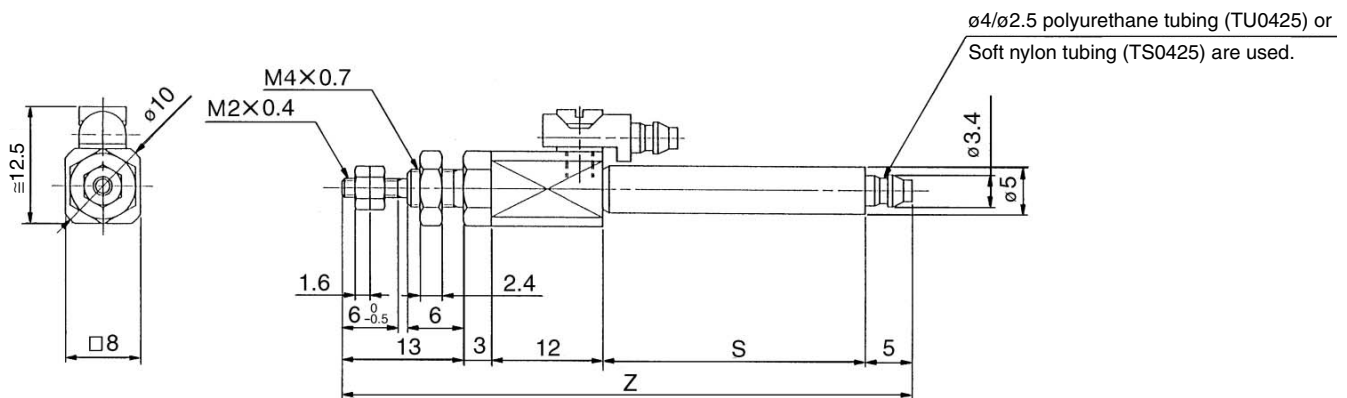
Construction



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------|---------------------------|
| ① | Rod cover | Brass | Electroless nickel plated |
| ② | Cylinder tube | Brass | Electroless nickel plated |
| ③ | Piston | Stainless steel | |
| ④ | Seal retainer | Brass | Electroless nickel plated |
| ⑤ | Fittings | Body Brass Gasket PVC | Electroless nickel plated |
| ⑥ | Rod seal | NBR | |
| ⑦ | Piston seal | NBR | |
| ⑧ | Tube gasket | NBR | |
| ⑨ | Mounting nut | Steel | Nickel plated |
| ⑩ | Rod end nut | Steel | Nickel plated |

Dimensions: Double Acting, Basic Style



| Symbol | S | | | | Z | | | |
|----------------|----|----|----|----|----|----|----|----|
| Bore size (mm) | 5 | 10 | 15 | 20 | 5 | 10 | 15 | 20 |
| Stroke | 18 | 23 | 28 | 33 | 51 | 56 | 61 | 66 |

Air Cylinder

Single Acting, Single Rod, Spring Return

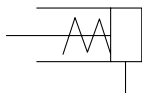
Series CJ1

ø2.5, ø4



JIS Symbol

Single acting, Spring return



⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Piping

⚠ Caution

- Do not force to connect piping in such a way that the lateral force could be applied on a cylinder tube. Because this could cause a cylinder tube to slant and malfunction.
Because this could cause a cylinder tube to tilt and malfunction.

Mounting

⚠ Caution

- Do not use it in such a way that a load could be applied to the piston rod during the retraction.
The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod will not be able to retract to the end of the stroke.
- Do not install it by directly grasping the cylinder tube, as this could cause a tube to deform and malfunction.

How to Order/Single Acting

CJ1B 4 10 S U4

Mounting style

B Basic style

Bore size

| | |
|---|--------|
| 2 | 2.5 mm |
| 4 | 4 mm |

Standard stroke (mm)

| | |
|------|---------------|
| ø2.5 | 5, 10 |
| ø4 | 5, 10, 15, 20 |

Applicable tubing

| Symbol | Tubing material | Size | |
|--------|-----------------|------|-----------|
| | | O.D. | Bore size |
| U4 | Polyurethane | 4 mm | 2.5 mm |
| | Soft nylon | 4 mm | 2.5 mm |

Single acting, Spring return

Specifications

| | |
|-------------------------------|------------------------------|
| Action | Single acting, Spring return |
| Fluid | Air |
| Proof pressure | 1.05 MPa |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.3 MPa |
| Ambient and fluid temperature | -10 to 70°C (No freezing) |
| Piston speed | 50 to 500 mm/s |
| Cushion | None |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | $^{+0.5}_0$ mm |
| Mounting | Basic style |
| Lubrication | Not required (Non-lube) |

Model/Bore Size/Standard Stroke

| Model | Bore size (mm) | Standard stroke (mm) |
|--------------|----------------|----------------------|
| CJ1B2 | 2.5 | 5, 10 |
| CJ1B4 | 4 | 5, 10, 15, 20 |

Applicable Tubing

| Tubing type | Material | Size | | Model no. |
|-------------|--------------|------|-----------|-----------|
| | | O.D. | Bore size | |
| Metric size | Polyurethane | 4 mm | 2.5 mm | TU0425 |
| | Soft nylon | 4 mm | 2.5 mm | TS0425 |

Theoretical Output

(N)

| Bore size (mm) | Rod size (mm) | Operating direction | Piston area (mm ²) | Operating pressure (MPa) | | | | |
|----------------|---------------|---------------------|--------------------------------|--------------------------|------|------|------|------|
| | | | | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 2.5 | 1 | OUT | 4.9 | 0.34 | 0.83 | 1.32 | 1.81 | 2.30 |
| | | IN | — | 0.64 | | | | |
| 4 | 2 | OUT | 12.6 | 0.74 | 2.00 | 3.26 | 4.52 | 5.78 |
| | | IN | — | 1.47 | | | | |

Spring Force

(N)

| Bore size (mm) | Retracted side | Extended side |
|----------------|----------------|---------------|
| 2.5 | 1.13 | 0.64 |
| 4 | 3.04 | 1.47 |

Weight

(g)

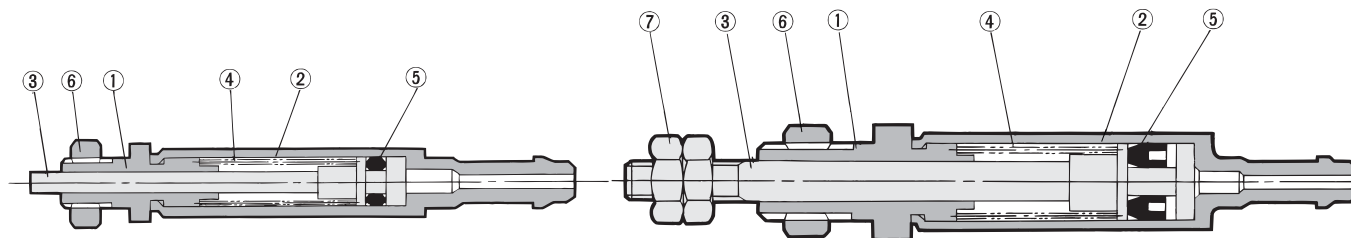
| Bore size (mm) | 5 | 10 | 15 | 20 |
|----------------|-----|-----|-----|-----|
| 2.5 | 1.5 | 2 | — | — |
| 4 | 3.7 | 4.6 | 5.6 | 6.5 |

Air Cylinder Single Acting, Single Rod, Spring Return **Series CJ1**

Construction (Not able to disassemble.)

CJ1B2-□SU4

CJ1B4-□SU4

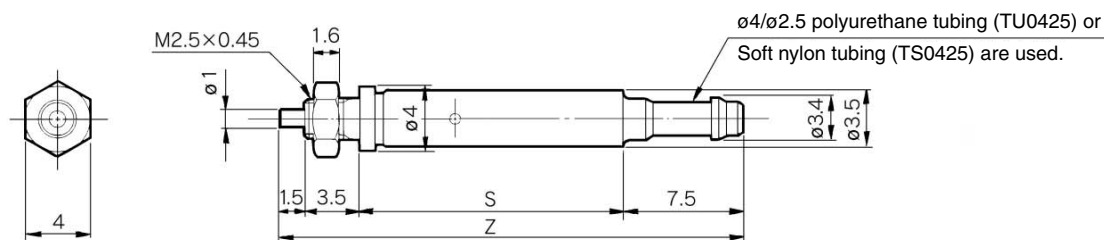


Component Parts

| No. | Description | Material | Note |
|-----|---------------|----------------------|---------------------------|
| ① | Rod cover | Brass | Electroless nickel plated |
| ② | Cylinder tube | Brass | Electroless nickel plated |
| ③ | Piston rod | Stainless steel | |
| ④ | Spring | Stainless steel wire | |
| ⑤ | Piston seal | NBR | |
| ⑥ | Mounting nut | Brass | Black zinc chromated |
| ⑦ | Rod end nut | Steel | Electroless nickel plated |

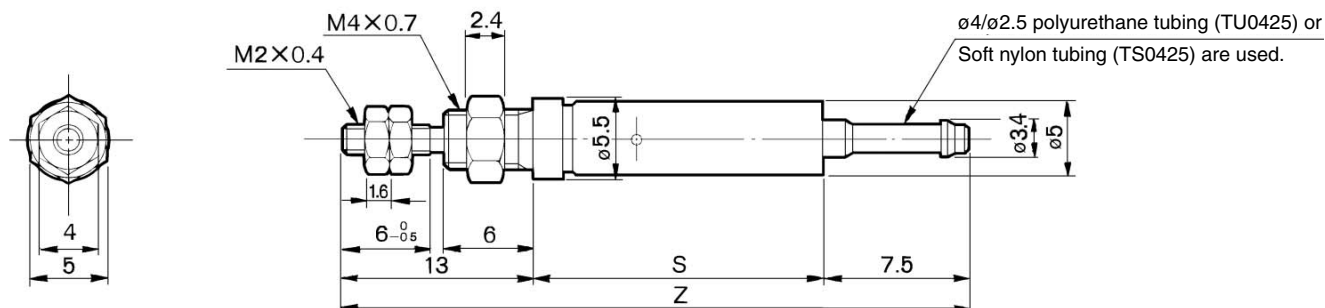
Basic Style

Bore size: $\phi 2.5$ /CJ1B2-□SU4



| Bore size (mm) | Symbol Stroke | | S | | Z | |
|----------------|------------------|------|----|----|---|----|
| | 5 | 10 | 5 | 10 | 5 | 10 |
| 2.5 | 16.5 | 25.5 | 29 | 38 | | |

Bore size: $\phi 4$ /CJ1B4-□SU4



| Bore size (mm) | Symbol Stroke | | | | S | | | | Z | | | |
|----------------|------------------|------|------|------|----|----|----|----|---|----|----|----|
| | 5 | 10 | 15 | 20 | 5 | 10 | 15 | 20 | 5 | 10 | 15 | 20 |
| 4 | 19.5 | 28.5 | 37.5 | 46.5 | 40 | 49 | 58 | 67 | | | | |



Air Cylinder

Series CJ2

ø6, ø10, ø16



Improved wear resistance

The bearing portions of the rod cover and the clevis have been improved in wear resistance to ensure the longevity of the cylinder.

Easy installation

The installation is simple because a tool can be placed directly over the cover for installation.

Reduced piston rod deflection

The clearance between the bushing and the piston rod has been decreased to achieve higher accuracy, thus decreasing the deflection of the piston rod.

High speed actuation possible

Either the rubber bumper or the air cushion can be selected according to the drive speed conditions. Therefore, it can support high speed drives.

- Rubber bumper.....50 to 750 mm/s (Standard equipment)
- Air cushion.....50 to 1000 mm/s

Series Variations

| Series | Action | Rod | Basic | Standard variations | | | | Bore size (mm) | Page |
|--|---------------|---|-------|---------------------|------------------|--------------|-------------|----------------|--------|
| | | | | Built-in magnet | With air cushion | Clean series | Copper-free | | |
| Standard Series CJ2 | Double acting | Single rod | ● | ● | ● | ● | ● | 6 10 16 | 6-3-2 |
| | | Double rod | ● | ● | ● | ● | ● | | 6-3-14 |
| | Single acting | Single rod, Spring return/ Spring extend | ● | ● | | | ● | | 6-3-22 |
| Non-rotating Rod Series CJ2K | Double acting | Single rod | ● | ● | | | ● | 10 16 | 6-3-33 |
| | Single acting | Single rod, (Spring return/ Spring extend) | ● | ● | | | ● | | 6-3-38 |
| Built-in Speed Controller Series CJ2Z | Double acting | Single rod | ● | ● | | | ● | 10 16 | 6-3-45 |
| | | Double rod | ● | ● | | | ● | | 6-3-50 |
| Low Friction Series CJ2Q | Double acting | Single rod | ● | ● | | | | 10 16 | 6-3-55 |
| Direct Mount Series CJ2R | Double acting | Single rod | ● | ● | | ● | ● | 10 16 | 6-3-59 |
| | Single acting | Single rod, (Spring return/ Spring extend) | ● | ● | | | ● | | 6-3-64 |
| Direct Mount, Non-Rotating Rod Series CJ2RK | Double acting | Single rod | ● | ● | | | ● | 10 16 | 6-3-68 |
| | Single acting | Single rod, (Spring return/ Spring extend) | ● | ● | | | ● | | 6-3-72 |
| With end lock Series CBJ2 | Double acting | Single rod | ● | ● | | | | 16 | 6-3-77 |

| Type | Band mounting style | Rail mounting style |
|--------------------|---------------------------------------|---|
| Reed switch | D-C7□/C80, D-C73C/C80C | D-A7□/A80, D-A7□H/A80H, D-A73C/A80C, D-A79W |
| Solid state switch | D-H7□, D-H7C, D-H7□W, D-H7BAL, D-H7NF | D-F7□/J79, D-F7□V, D-J79C, D-F7□W/J79W, D-F7□WV, D-F7BAL, D-F79F, D-F7NTL, D-F7BAVL |

Air Cylinder: Standard Type Double Acting, Single Rod

Series CJ2

ø6, ø10, ø16

How to Order

Bore size

| | |
|----|-------|
| 6 | 6 mm |
| 10 | 10 mm |
| 16 | 16 mm |

Standard stroke (mm)

| | |
|-----|---|
| ø6 | 15, 30, 45, 60 |
| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting style

| | |
|---|---------------------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style (Except ø6) |

Cushion

| | |
|-----|-------------------------|
| Nil | Rubber bumper |
| A | Air cushion (Except ø6) |

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|--------------|
| Example | Rail mounting style | CDJ2B10-45-A |
| | Band mounting style | CDJ2B16-60-B |

* For rail mounting style, screws and nuts for 2 pcs switches come with the rail.

Without auto switch CJ2 L 16 60 A R

With auto switch CDJ2 L 16 60 A R J79W

Band mounting style

Rail mounting style

Port location on head cover

| Bore size (mm) | 6 | 10, 16 |
|----------------|------------------|-----------------------|
| Symbol | Nil | Perpendicular to axis |
| R | Axial foot style | Axial foot style |

* For configuration, refer to page 6-3-4.
* Double clevis style is only available for being perpendicular to axis.

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator/light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|---------------------------------|--------------------------|---------|------------------------|----------|----------|-------------|--------------------|-----------------|------------|------------|---|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| | | | | | | | | Perpendicular | In-line | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | — | | |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | Relay, PLC | | | |
| | 24 V | | | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | | | |
| | | | | — | — | — | C73C | A73C | — | ● | ● | ● | ● | | | | — | — |
| | With diagnostic output (2-color indication) | Grommet | | | | | — | A79W ** | — | | ● | ● | — | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | 12 V | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | ○ | — | | |
| | | 2-wire | | | | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | | | |
| | | | | 2-wire | | | | 12 V | H7C | J79C | — | ● | ● | ● | ● | — | | — |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | — | | |
| | | | | 2-wire | | | | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | | | ○ |
| | | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | | | ○ |
| | Water resistant (2-color indication) | | | 2-wire | | 12 V | | — | F7BAV | — | — | ● | ○ | — | — | | | |
| | With diagnostic output (2-color indication) | | | 4-wire (NPN) | | 5 V, 12 V | | H7NF | — | F79F | ● | ● | ○ | — | ○ | — | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

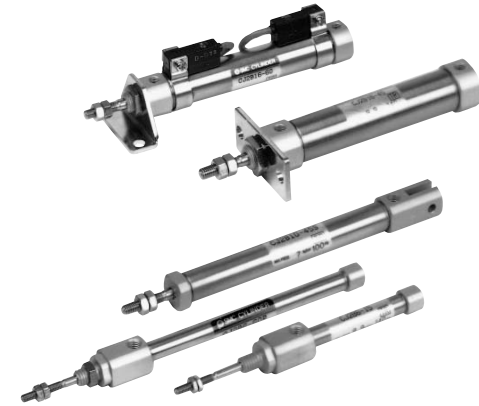
* Solid state switches marked with "○" are produced upon receipt of order.
** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Standard Type Double Acting, Single Rod **Series CJ2**

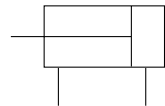
Specifications

| | | |
|-------------------------------|---|----------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.12 MPa |
| | ø10, ø16 | 0.06 MPa |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper/Air cushion | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø6 | 0.012 J |
| | ø10 | 0.035 J |
| | ø16 | 0.090 J |



JIS Symbol

Double acting,
Single rod



Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 6 | 15, 30, 45, 60 |
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) | Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|---------------------------------------|--------------------------------------|------------------------------|------------------------------|-----------------------------------|------------------------------------|---------------------------------------|------------------------------|
| Band mounting style (ø6, ø10, ø16) | D-C7□ D-C80 | 3 (Same side) | 90 | Rail mounting style (ø10, ø16) | D-A7□ D-A80 D-A73C D-A80C | 3 | 35 |
| | | 3 (Different sides) | 55 | | | 2 | 10 |
| | | 2 (Same side) | 50 | | | 1 | 5 |
| | | 2 (Different sides) | 15 | | | D-A7□H D-A80H | 3 |
| | | 1 | 10 | | 2 | | 10 |
| | 3 (Same side) | 105 | 1 | | 5 | | |
| | D-H7□ D-H7□W D-H7BAL D-H7NF | 3 (Different sides) | 60 | | D-A79W | 3 | 40 |
| | | 2 (Same side) | 60 | | | 2 | 15 |
| | | 2 (Different sides) | 15 | | | 1 | 10 |
| | | 1 | 10 | | | D-F7□ D-J79 | 3 |
| | | 3 (Same side) | 105 | | 2 | | 5 |
| | 3 (Different sides) | 65 | 1 | | 5 | | |
| | D-C73C D-C80C D-H7C | 2 (Same side) | 65 | | D-F7□V D-J79C | 3 | 30 |
| | | 2 (Different sides) | 15 | | | 2 | 5 |
| | | 1 | 10 | | | 1 | 5 |
| | | | | | | D-F7□W D-J79W D-F7BAL D-F79F | 3 |
| | | | 2 | | 15 | | |
| | | | 1 | | 10 | | |
| | | | 3 | | 40 | | |
| | | | | | D-F7□WV D-F7BAVL | 2 | 15 |
| | | | | | | 1 | 10 |



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) * Not available with switch & with air cushion |
| -XB7 | Cold resistant cylinder * Not available with switch & with air cushion |
| -XB9 | Low speed cylinder (10 to 50 mm/s) * Not available with air cushion |
| -XB13 | Low speed cylinder (5 to 50 mm/s) * Not available with air cushion |
| -XC3 | Special port location * Not available with air cushion |
| -XC8 | Adjustable stroke cylinder/Adjustable extension type |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC10 | Dual stroke cylinder/Double rod type |
| -XC11 | Dual stroke cylinder/Single rod type |
| -XC22 | Fluoro rubber seals * Not available with air cushion |
| -XC51 | With hose nipple |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Mounting Style and Accessory/For details, refer to page 6-3-11.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double * clevis style |
|--------------------|------------------------|-------------|------------------|-----------------------|-----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | | |
|------------------|----------------|----------|----------|
| | 6 | 10 | 16 |
| Foot bracket | CJ-L006B | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F006B | CJ-F010B | CJ-F016B |
| T-bracket * | — | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 6 | BJ2-006 | Common for the types of D-C7/C8 and D-H7 |
| 10 | BJ2-010 | |
| 16 | BJ2-016 | |

[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

“D-H7BAL” switch is set on the cylinder with the stainless steel screws above when shipped.

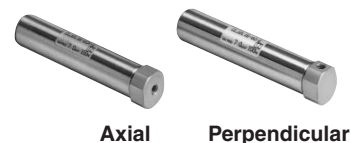
When only a switch is shipped independently, “BBA4” screws are attached.

Theoretical Output

Refer to “Double acting cylinder” in Theoretical Output Table 1 of Technical data 3 on page 6-19-1.

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style. (ø6 is available only as in-line style.)



Weight

(g)

| Bore size (mm) | | 6 | 10 | 16 |
|--|----------------------------------|----|----|------|
| Basic weight * | | 15 | 24 | 55 |
| Additional weight per each 15 mm of stroke | | 2 | 4 | 6.5 |
| Mounting bracket weight | Axial foot style | 8 | 8 | 20 |
| | Rod side flange style | 5 | 5 | 15 |
| | Double clevis style (With pin) * | — | 4 | 10 |
| Accessory bracket | Single knuckle joint | — | 16 | 22 |
| | Double knuckle joint (With pin) | — | 24 | 19.5 |
| | T-bracket | — | 32 | 50 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2L10-45

- Basic weight 24 (ø10)
 - Additional weight 4/15 stroke
 - Cylinder stroke 45 stroke
 - Mounting bracket weight .. 8 (Axial foot style)
- 24 + 4/15 x 45 + 8 = 44 g

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining but or to the rod cover body.
If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below.
ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m, ø16: 10.8 to 11.8 N·m
- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring).
In particular, use a pair of ultra-mini pliers such as the Super Tool CSM-07A for removing and installing the snap ring on the ø10 cylinder.
- In the case of auto switch rail mounting style, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

With Air Cushion

CJ2 **Mounting style** **Bore size** **Stroke** **A** **Port location on head cover**

• **With air cushion**

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed.



Specifications

| | |
|----------------------------|---|
| Action | Double acting, Single rod |
| Type | Non-lube |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.1 MPa |
| Piston speed | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style |

Cushion Mechanism

| Bore size (mm) | Effective cushioning length (mm) | Kinetic energy absorbable (J) |
|----------------|----------------------------------|-------------------------------|
| 10 | 9.4 | 0.07 J |
| 16 | 9.4 | 0.18 J |

* For construction, refer to page 6-3-6.

Clean Series

10-CJ2 **Mounting style** **Bore size** **Stroke** **Port location on head cover**

• **Clean Series**

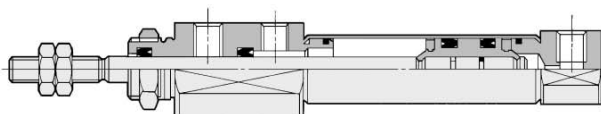
Air cylinder which is applicable for the system which discharges leakage from the rod section directly into the outside of clean room by relief port and making an actuator's rod section having a double seal construction.



Specifications

| | | |
|----------------------------|--|----------|
| Action | Double acting, Single rod | |
| Bore size (mm) | 6, 10, 16 | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.14 MPa |
| | ø10, ø16 | 0.08 MPa |
| Cushion | Rubber bumper/Air cushion | |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-3.) | |
| Auto switch | Mountable (Band mounting style) | |
| Mounting | Basic style, Axial foot style, Rod side flange style | |

Construction



For details, refer to the separate catalog "Pneumatic Clean Series".

Copper-free (For CRT manufacturing process)

20-CJ2 **Mounting style** **Bore size** **Stroke** **Port location on head cover**

• **Copper-free**

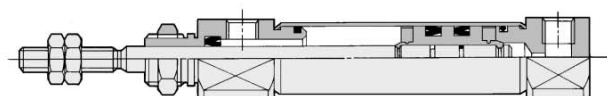
Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.



Specifications

| | | |
|----------------------------|---|----------|
| Action | Double acting, Single rod | |
| Bore size (mm) | 6, 10, 16 | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.12 MPa |
| | ø10, ø16 | 0.06 MPa |
| Cushion | Rubber bumper (Standard equipment) | |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-3.) | |
| Auto switch | Mountable (Band mounting style) | |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style (Except ø6) | |

Construction



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

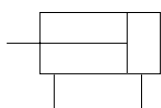
-X

20-

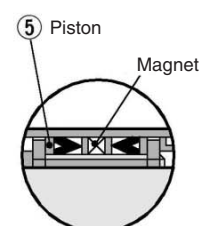
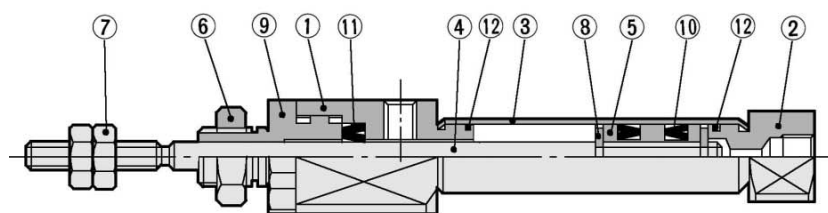
Data

Series CJ2

Construction (Not able to disassemble.)

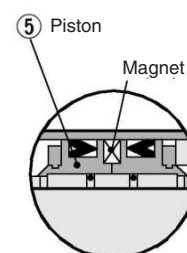
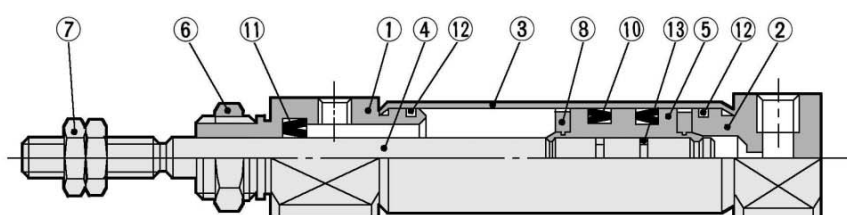


CJ2□6-R



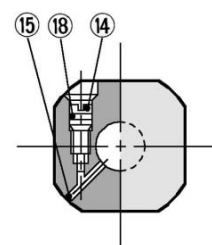
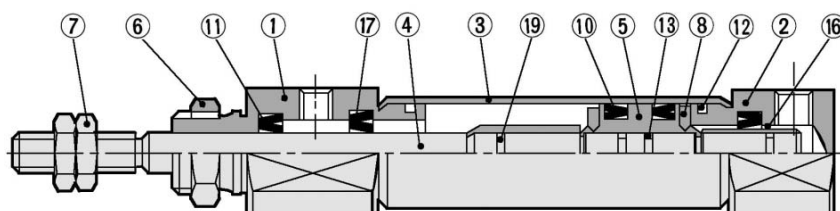
Piston construction when auto switch is mounted.

CJ2□10, CJ2□16



Piston construction when auto switch is mounted.

With air cushion



Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Mounting nut | Brass | Nickel plated |
| ⑦ | Rod end nut | Rolled steel | Nickel plated |
| ⑧ | Bumper | Urethane | |
| ⑨* | Seal retainer | Aluminum alloy | Anodized |
| ⑩ | Piston seal | NBR | |
| ⑪ | Rod seal | NBR | |
| ⑫ | Tube gasket | NBR | |
| ⑬ | Piston gasket | NBR | |

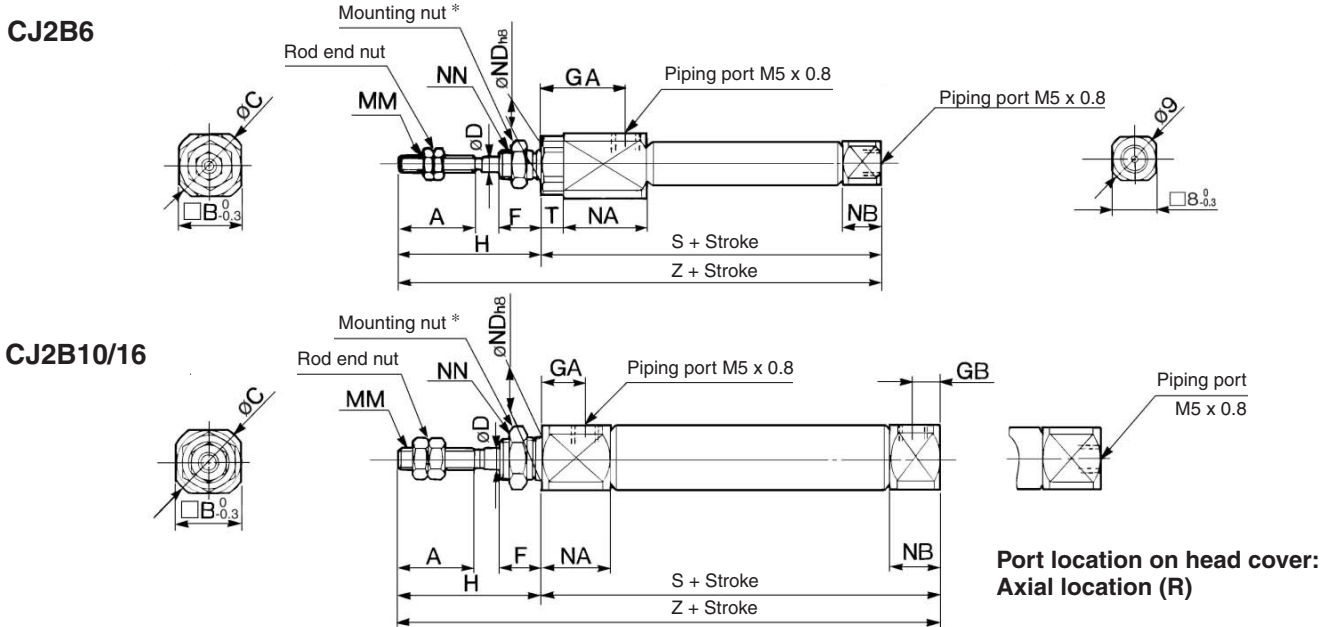
* Only for ø6

Dedicated for with Air Cushion Type

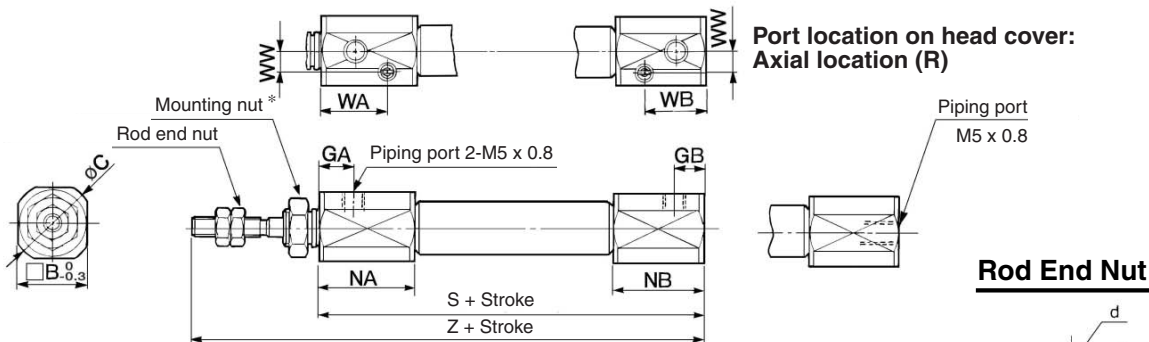
| No. | Description | Material | Note |
|-----|---------------------|-----------------|------|
| ⑭ | Cushion needle | Stainless steel | |
| ⑮ | Steel balls | Bearing steel | |
| ⑯ | Cushion ring | Brass | |
| ⑰ | Check seal | NBR | |
| ⑱ | Needle seal | NBR | |
| ⑲ | Cushion ring gasket | NBR | |

Basic Style (B)

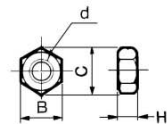
CJ2B Bore size — Stroke Port location on head cover



With air cushion: CJ2B Bore size — Stroke A Port location on head cover



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GA | GB | H | MM | NA | NB | NDh8 | NN | S | T | Z |
|----------------|----|------|----|---|---|------|----|----|----------|------|-----|-----------------------------------|-----------|----|---|----|
| 6 | 15 | 12 | 14 | 3 | 8 | 14.5 | — | 28 | M3 x 0.5 | 16 | 7 | 6 ⁰ _{-0.018} | M6 x 1.0 | 49 | 3 | 77 |
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | 8 ⁰ _{-0.022} | M8 x 1.0 | 46 | — | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1.0 | 47 | — | 75 |

With Air Cushion Dimensions other than the table below are the same as the table above.

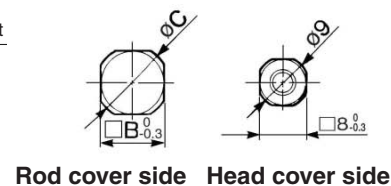
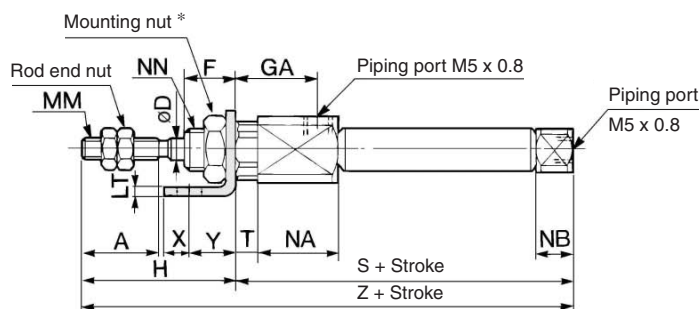
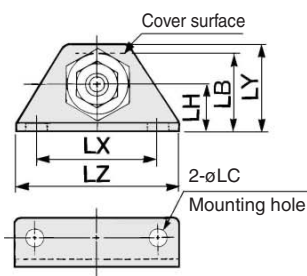
| Bore size (mm) | B | C | GA | GB | NA | NB | WA | WB | WW | S | Z |
|----------------|------|----|-----|-----|----|----|------|------|-----|----|----|
| 10 | 15 | 17 | 7.5 | 6.5 | 21 | 20 | 14.5 | 13.5 | 4.5 | 65 | 93 |
| 16 | 18.3 | 20 | 7.5 | 6.5 | 21 | 20 | 14.5 | 13.5 | 5.5 | 66 | 94 |

Series CJ2

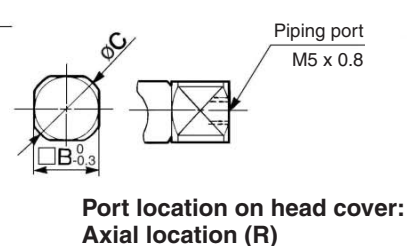
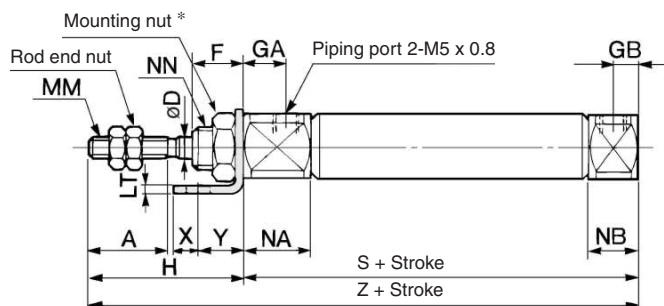
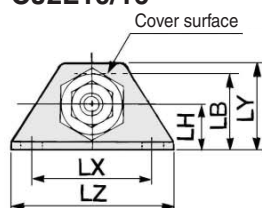
Axial Foot Style (L)

CJ2L Bore size Stroke Port location on head cover

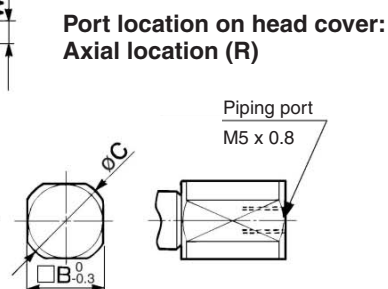
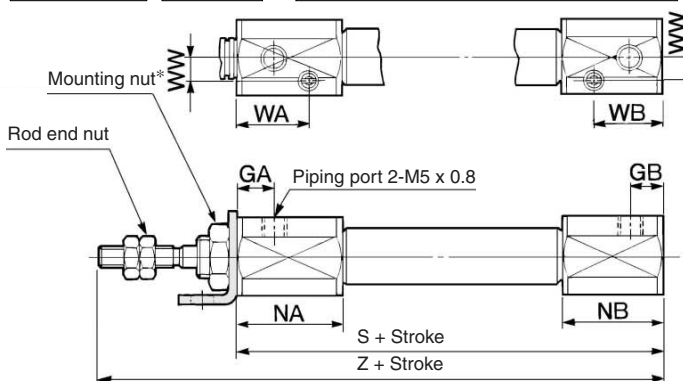
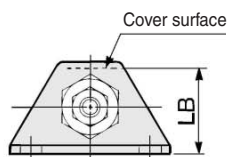
CJ2L6



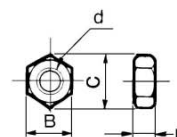
CJ2L10/16



With air cushion: CJ2L Bore size Stroke A Port location on head cover



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GA | GB | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | S | T | X | Y | Z |
|----------------|----|------|----|---|---|------|----|----|----|-----|----|-----|----|------|----|----------|------|-----|-----------|----|---|---|---|----|
| 6 | 15 | 12 | 14 | 3 | 8 | 14.5 | — | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M3 x 0.5 | 16 | 7 | M6 x 1.0 | 49 | 3 | 5 | 7 | 77 |
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | — | 5 | 7 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | — | 6 | 9 | 75 |

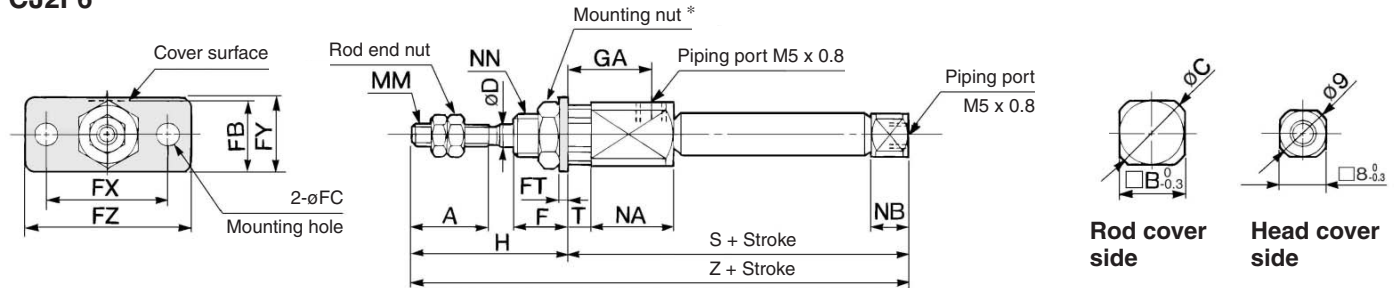
With Air Cushion/Dimensions other than the table below are the same as the table above.

| Bore size (mm) | B | C | GA | GB | LB | NA | NB | WA | WB | WW | S | Z |
|----------------|------|----|-----|-----|------|----|----|------|------|-----|----|----|
| 10 | 15 | 17 | 7.5 | 6.5 | 16.5 | 21 | 20 | 14.5 | 13.5 | 4.5 | 65 | 93 |
| 16 | 18.3 | 20 | 7.5 | 6.5 | 23 | 21 | 20 | 14.5 | 13.5 | 5.5 | 66 | 94 |

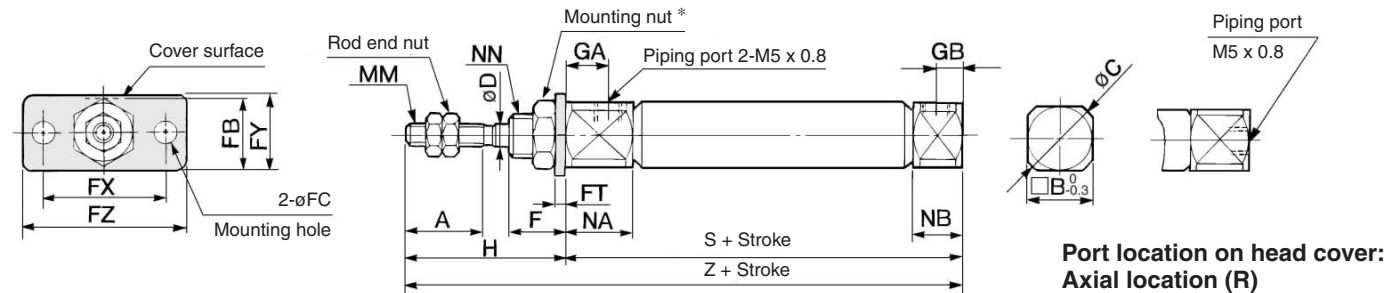
Rod Side Flange Style (F)

CJ2F Bore size Stroke Port location on head cover

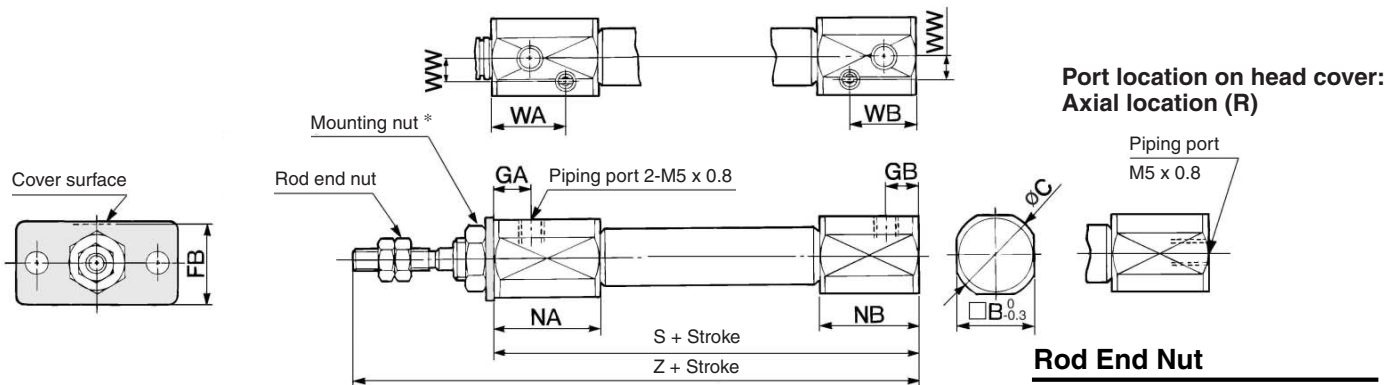
CJ2F6



CJ2F10/16



With air cushion: CJ2F Bore size Stroke A Port location on head cover



* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | MM | NA | NB | NN | S | T | Z |
|----------------|----|------|----|---|---|----|-----|-----|----|----|----|------|----|----|----------|------|-----|-----------|----|---|----|
| 6 | 15 | 12 | 14 | 3 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 14.5 | — | 28 | M3 x 0.5 | 16 | 7 | M6 x 1.0 | 49 | 3 | 77 |
| 10 | 15 | 12 | 14 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | M8 x 1.0 | 46 | — | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | M10 x 1.0 | 47 | — | 75 |

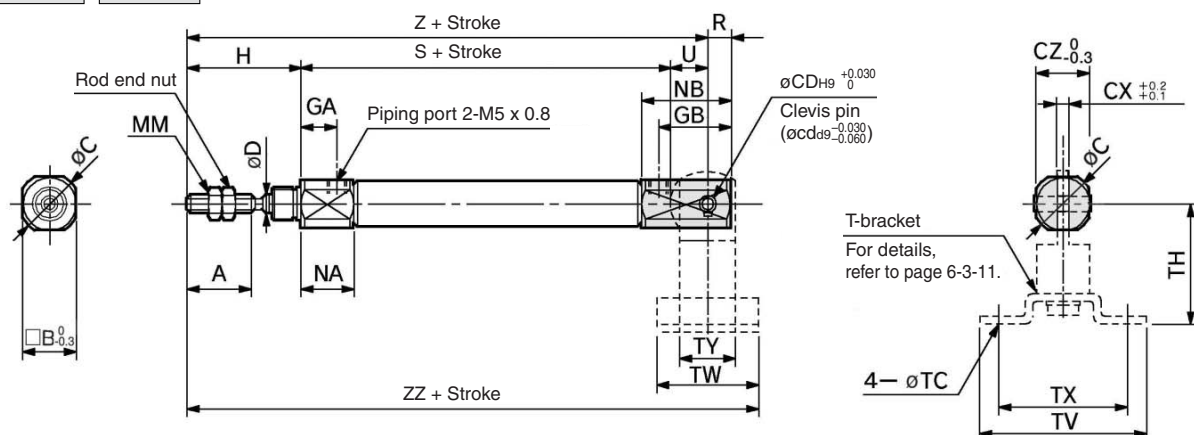
With Air Cushion/Dimensions other than the table below are the same as the table above.

| Bore size (mm) | B | C | FB | GA | GB | NA | NB | WA | WB | WW | S | Z |
|----------------|------|----|------|-----|-----|----|----|------|------|-----|----|----|
| 10 | 15 | 17 | 14.5 | 7.5 | 6.5 | 21 | 20 | 14.5 | 13.5 | 4.5 | 65 | 93 |
| 16 | 18.3 | 20 | 19 | 7.5 | 6.5 | 21 | 20 | 14.5 | 13.5 | 5.5 | 66 | 94 |

Series CJ2

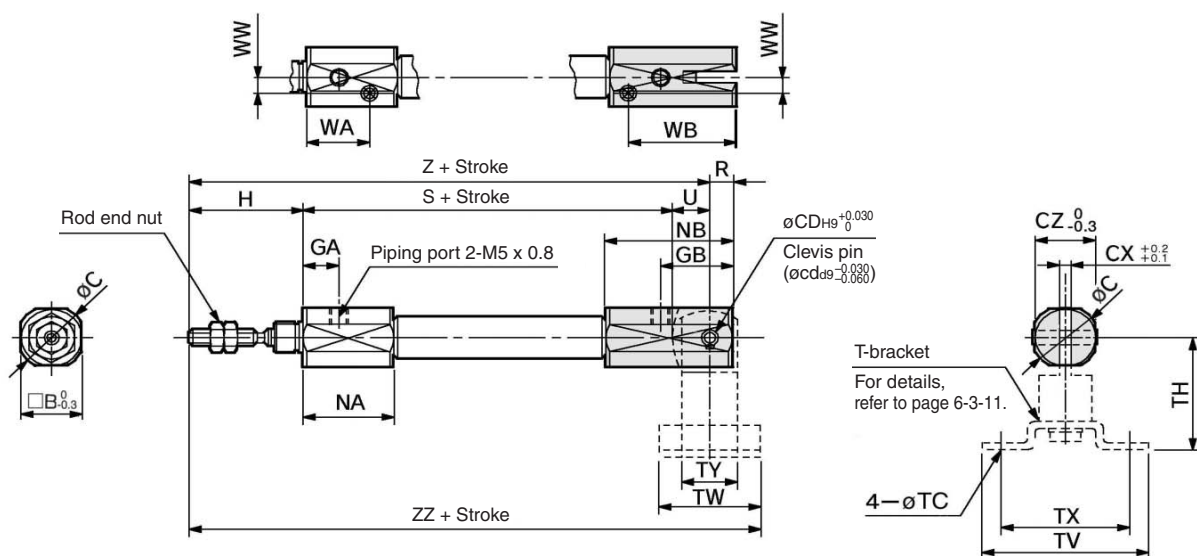
Double Clevis Style (D)

CJ2D Bore size Stroke

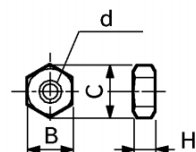


* Clevis pin and set ring are shipped together.

With air cushion: CJ2D Bore size Stroke A



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | B | C | CD (cd) | CX | CZ | D | GA | GB | H | MM | NA | NB | R | S | U | Z | ZZ |
|----------------|----|------|----|---------|-----|------|---|----|----|----|----------|------|------|---|----|----|----|----|
| 10 | 15 | 12 | 14 | 3.3 | 3.2 | 12 | 4 | 8 | 18 | 28 | M4 x 0.7 | 12.5 | 22.5 | 5 | 46 | 8 | 82 | 93 |
| 16 | 15 | 18.3 | 20 | 5 | 6.5 | 18.3 | 5 | 8 | 23 | 28 | M5 x 0.8 | 12.5 | 27.5 | 8 | 47 | 10 | 85 | 99 |

T-bracket Dimensions

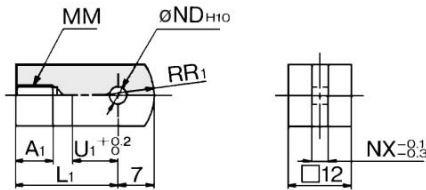
| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |

With Air Cushion/Dimensions other than the table below are the same as the table above.

| Bore size (mm) | B | C | CZ | GA | GB | NA | NB | S | WA | WB | WW | Z | ZZ |
|----------------|------|----|------|-----|------|----|----|----|------|------|-----|-----|-----|
| 10 | 15 | 17 | 15 | 7.5 | 19.5 | 21 | 33 | 65 | 14.5 | 26.5 | 4.5 | 101 | 112 |
| 16 | 18.3 | 20 | 18.3 | 7.5 | 24.5 | 21 | 38 | 66 | 14.5 | 31.5 | 5.5 | 104 | 118 |

Accessory Bracket Dimensions

Single Knuckle Joint

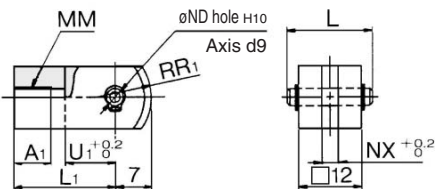


Material: Rolled steel

| Part no. | Applicable bore (mm) | A ₁ | L ₁ | MM | ND ^{H10} | NX | R ₁ | U ₁ |
|----------|----------------------|----------------|----------------|----------|---|-----|----------------|----------------|
| I-J010B | 10 | 8 | 21 | M4 x 0.7 | 3.3 ^{+0.048} _{-0.060} | 3.1 | 8 | 9 |
| I-J016B | 16 | 8 | 25 | M5 x 0.8 | 5.3 ^{+0.048} _{-0.060} | 6.4 | 12 | 14 |

Double Knuckle Joint

* Knuckle pin and set ring are shipped together.

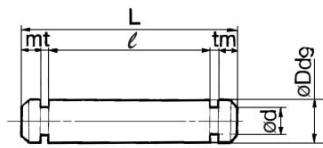


Material: Rolled steel

| Part no. | Applicable bore (mm) | A ₁ | L | L ₁ | MM |
|----------|----------------------|----------------|------|----------------|----------|
| Y-J010B | 10 | 8 | 15.2 | 21 | M4 x 0.7 |
| Y-J016B | 16 | 11 | 16.6 | 21 | M5 x 0.8 |

| Part no. | ND ₉ | ND ^{H10} | NX | R ₁ | U ₁ |
|----------|---|------------------------------------|-----|----------------|----------------|
| Y-J010B | 3.3 ^{-0.030} _{-0.060} | 3.3 ^{+0.048} ₀ | 3.2 | 8 | 10 |
| Y-J016B | 5.3 ^{-0.030} _{-0.060} | 5.3 ^{+0.048} ₀ | 6.5 | 12 | 10 |

Clevis Pin

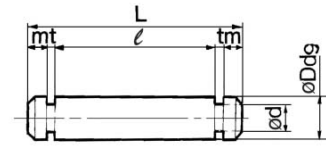


Material: Stainless steel

| Part no. | Applicable bore (mm) | Dd ₉ | d | L | ℓ | m | t | Applicable snap ring |
|-----------|----------------------|---|-----|------|------|-----|-----|----------------------|
| CD-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| CD-Z015 | 16 | 5.3 ^{-0.030} _{-0.060} | 4.8 | 22.7 | 18.3 | 1.5 | 0.7 | Type C 5 |
| CD-JA010* | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 18.2 | 15.2 | 1.2 | 0.3 | Type C 3.2 |

* For ø10 double clevis style, with air cushion and built-in speed controller.

Knuckle Pin

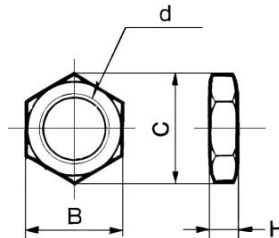


Material: Stainless steel

| Part no. | Applicable bore (mm) | Dd ₉ | d | L | ℓ | m | t | Applicable snap ring |
|----------|----------------------|---|-----|------|------|-----|-----|----------------------|
| CD-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| IY-J015 | 16 | 5.3 ^{-0.030} _{-0.060} | 4.8 | 16.6 | 12.2 | 1.5 | 0.7 | Type C 5 |

* For size ø10, clevis pin is diverted.

Mounting Nut

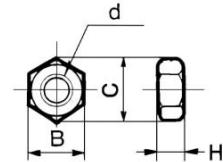


Material: Brass

| Part no. | Applicable bore (mm) | B | C | d | H |
|------------|----------------------|----|------|-----------|---|
| SNJ-006B | 6 | 8 | 9.2 | M6 x 1.0 | 4 |
| SNJ-010B | 10 | 11 | 12.7 | M8 x 1.0 | 4 |
| SNJ-016B | 16 | 14 | 16.2 | M10 x 1.0 | 4 |
| SNKJ-016B* | 16 | 17 | 19.6 | M12 x 1.0 | 4 |

* For ø16 non-rotating type. (Use SNJ-016B for ø10 non-rotating type.)

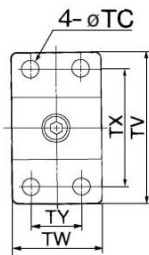
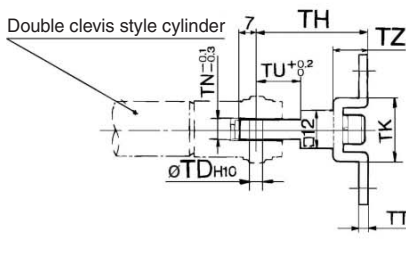
Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

T-bracket

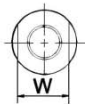
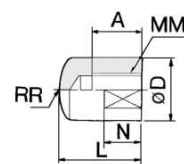
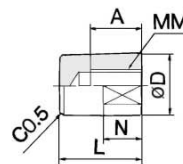


| Part no. | Applicable bore (mm) | TC | TD ^{H10} | TH | TK | TN | TT | TU | TV | TW | TX | TY | TZ |
|----------|----------------------|-----|---|----|----|-----|-----|----|----|----|----|----|----|
| CJ-T010B | 10 | 4.5 | 3.3 ^{+0.048} _{-0.060} | 29 | 18 | 3.1 | 2 | 9 | 40 | 22 | 32 | 12 | 8 |
| CJ-T016B | 16 | 5.5 | 5 ^{+0.048} ₀ | 35 | 20 | 6.4 | 2.3 | 14 | 48 | 28 | 38 | 16 | 10 |

Rod End Cap

Flat type/CJ-CF□□□

Round type/CJ-CR□□□

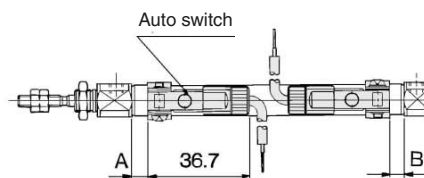
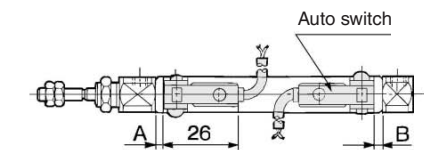


Material: Polyacetal

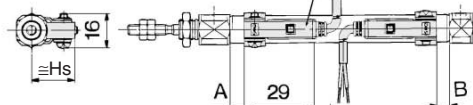
| Part no. | | Applicable bore (mm) | A | D | L | MM | N | R | W |
|-----------|------------|----------------------|----|----|----|----------|---|----|----|
| Flat type | Round type | | | | | | | | |
| CJ-CF006 | CJ-CR006 | 6 | 6 | 8 | 11 | M3 x 0.5 | 5 | 8 | 6 |
| CJ-CF010 | CJ-CR010 | 10 | 8 | 10 | 13 | M4 x 0.7 | 6 | 10 | 8 |
| CJ-CF016 | CJ-CR016 | 16 | 10 | 12 | 15 | M5 x 0.8 | 7 | 12 | 10 |

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-C7□/C80

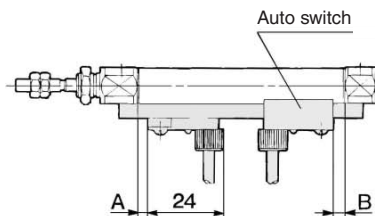

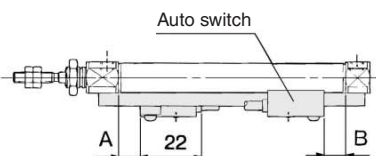
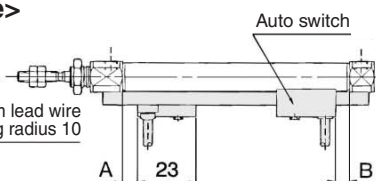
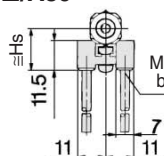


D-H7□
D-H7□W
D-H7BAL
D-H7NF

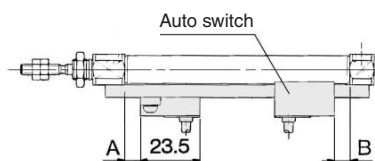


Technical drawing of the Auto switch (Type 1). The drawing includes a side view and an end view. The side view shows a horizontal assembly with a central section of length 38.2. The end view shows a circular component with a diameter of 10 and a height of $\approx Hs$. The side view is divided into two main sections, A and B, with a central section of length 38.2. The end view is labeled with dimensions $\approx Hs$ and 10. The side view is labeled with dimensions A, 38.2, and B. The end view is labeled with dimensions $\approx Hs$ and 10.

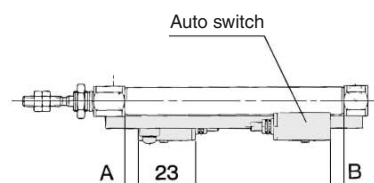
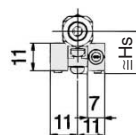
D-A7□/A80



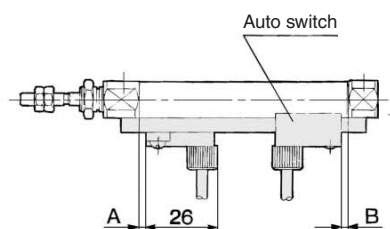
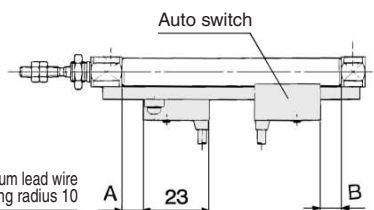
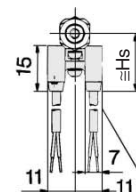
Minimum lead wire bending radius 10



D-F7□/J79
D-F7□W/J79W
D-F79F/F7BAL



D-F7□V/F7□WV
D-F7BAVL



Proper Auto Switch Mounting Position

| Auto switch model Bore size (mm) | D-C7□ D-C80 D-C73C D-C80C | | D-H7□ D-H7C D-H7NF D-H7□W D-H7BAL | | D-A7 D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C D-F7BAL D-F7BAVL | | D-A79W | |
|-------------------------------------|------------------------------------|------------|---|----------|---------------|-----|---|-----|--------|-----|
| | A | B | A | B | A | B | A | B | A | B |
| 6 | 2 (8.5) | 2 (0.5) | 1 (7.5) | 1 (0) | — | — | — | — | — | — |
| 10 | 2.5 | 2.5 | 1.5 | 1.5 | 3 | 3 | 3.5 | 3.5 | 0.5 | 0.5 |
| 16 | 3 | 3 | 2 | 2 | 3.5 | 3.5 | 4 | 4 | 1 | 1 |

* Figures in parentheses for bore ø6 are in the case of double rod type, (Series CJ2W).

Auto Switch Mounting Height

| Auto switch model Bore size (mm) | D-C7□/C80 D-H7□/H7□W D-H7NF D-H7BAL | D-C73C D-C80C | D-H7C | D-A7□ D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL/F79F | D-A73C D-A80C | D-F7□V D-F7□WV D-F7BAVL | D-J79C | D-A79W |
|-------------------------------------|--|------------------|-------|----------------|---|------------------|-------------------------------|--------|--------|
| | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 6 | 15 | 17.5 | 18 | — | — | — | — | — | — |
| 10 | 17 | 19.5 | 20 | 16.5 | 17.5 | 23.5 | 20 | 23 | 19 |
| 16 | 20.5 | 23 | 23.5 | 19.5 | 20.5 | 26.5 | 23 | 26 | 22 |

Operating Range

| Auto switch model | Bore size (mm) | | |
|---|----------------|----|----|
| | 6 | 10 | 16 |
| D-C7□/C80 D-C73C/C80C | 6 | 7 | 7 |
| D-A7□/A80 D-A7H/A80H D-A73C/A80C | — | 8 | 9 |
| D-A79W | — | 11 | 13 |
| D-H7□/H7□W/H7BAL | 3 | 4 | 4 |
| D-H7C | 5 | 8 | 9 |
| D-H7NF | 4 | 5 | 5 |
| D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F D-J79C D-F7BAL/F7BAVL D-F7NTL | — | 5 | 5 |

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

| Type | Model | Electrical entry | Features |
|--------------------|---------|------------------|-------------------------|
| Reed switch | D-A80 | Grommet | Without indicator light |
| | D-A80H | Grommet | |
| | D-A80C | Connector | |
| | D-C80 | Grommet | |
| | D-C80C | Connector | |
| Solid state switch | D-F7NTL | Grommet | With timer |

* With pre-wire connector is available for D-F7NTL type, too. For details, refer to page 6-16-56.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-


-X

20-

Data

Air Cylinder: Standard Type Double Acting, Double Rod Series *CJ2W* ø6, ø10, ø16

How to Order



Bore size

| | |
|----|-------|
| 6 | 6 mm |
| 10 | 10 mm |
| 16 | 16 mm |

Mounting style

| | |
|---|--------------|
| B | Basic style |
| L | Foot style |
| F | Flange style |

Standard stroke (mm)

| | |
|--------------|----------------|
| ø6, ø10, ø16 | 15, 30, 45, 60 |
|--------------|----------------|

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-15.

Cushion

| | |
|-----|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting style) or "B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2WB16-60-A |
| | Band mounting style | CDJ2WB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

With auto switch

Ordering Example: CJ2W L 16 — 45 A

Ordering Example: CDJ2W L 16 — 45 A — J79W

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

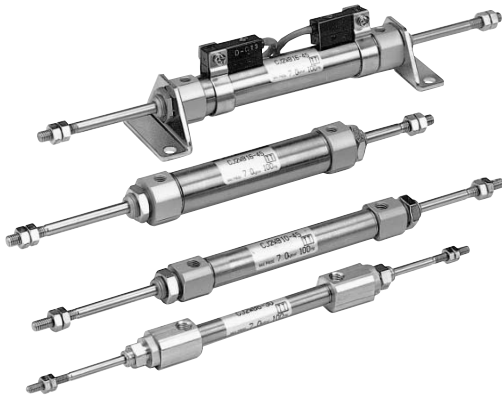
| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---|---|-----------------|-------------------------|--------------|-------|------------------------------|--|----------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) Perpendicular | In-line | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | — | | | |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | | | — | Relay, PLC | |
| | 24 V | | | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | | | |
| | | | | — | — | C73C | A73C | — | ● | ● | ● | ● | — | | | | | — |
| | With diagnostic output (2-color indication) | Grommet | | | | — | A79W ** | — | ● | ● | — | — | — | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | |
| | | 3-wire (PNP) | | H7A2 | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | | |
| | | Connector | | 2-wire | 12 V | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | — | | | |
| | | | | H7C | J79C | | — | ● | ● | ● | ● | — | — | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | 5 V, 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | | |
| | | | | 3-wire (PNP) | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | | |
| | Water resistant (2-color indication) | Grommet | | 2-wire | 12 V | | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | — | | | |
| | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | | | |
| | | | | | | | | — | F7BAV | — | — | ● | ● | ○ | — | | — | |
| | | With diagnostic output (2-color indication) | | | | | 4-wire (NPN) | 5 V, 12 V | H7NF *** | — | F79F | ● | ● | ○ | — | | ○ | IC circuit |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 ** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.
 *** "D-H7NF" cannot be mounted on bore size ø6 cylinder.

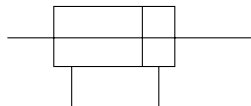
- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Standard Type Double Acting, Double Rod **Series CJ2W**



JIS Symbol

Double acting,
Double rod



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) * Not available with switch & with air cushion |
| -XB7 | Cold resistant cylinder * Not available with switch & with air cushion |
| -XC22 | Fluoro rubber seals * Not available with air cushion |
| -XC51 | With hose nipple |

Specifications

| | | |
|-------------------------------|---|----------|
| Action | Double acting, Double rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.15 MPa |
| | ø10, ø16 | 0.1 MPa |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper/Air cushion | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø6 | 0.012 J |
| | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|------------------|-----------------|
| 6, 10, 16 | 15, 30, 45, 60 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|---------------------------------------|---------------------------------------|------------------------------|------------------------------|
| Band mounting style (ø6, ø10, ø16) | D-C7□ D-C80 | 3 (Same side) | 90 |
| | | 3 (Different sides) | 55 |
| | | 2 (Same side) | 50 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |
| | D-H7□ D-H7□W D-H7BAL D-H7NF | 3 (Same side) | 105 |
| | | 3 (Different sides) | 60 |
| | | 2 (Same side) | 60 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |
| | D-C73C D-C80C D-H7C | 3 (Same side) | 105 |
| | | 3 (Different sides) | 65 |
| | | 2 (Same side) | 65 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |
| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
| Rail mounting style (ø10, ø16) | D-A7□ D-A80 D-A73C D-A80C | 3 | 35 |
| | | 2 | 10 |
| | | 1 | 5 |
| | | 3 | 45 |
| | | 2 | 10 |
| | D-A7□H D-A80H | 1 | 5 |
| | | 3 | 40 |
| | | 2 | 15 |
| | | 1 | 10 |
| | | 3 | 45 |
| | D-F7□ D-J79 | 2 | 5 |
| | | 1 | 5 |
| | | 3 | 30 |
| | | 2 | 5 |
| | | 1 | 5 |
| | D-F7□W D-J79W D-F7BAL D-F79F | 3 | 55 |
| | | 2 | 15 |
| | | 1 | 10 |
| | | 3 | 40 |
| | | 2 | 15 |
| | D-F7□WV D-F7BAVL | 1 | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2W

Mounting Style and Accessory/For details, refer to page 6-3-13.

| Mounting | | Basic style | Foot style | Flange style |
|--------------------|------------------------|-------------|------------|--------------|
| Standard equipment | Mounting nut | ● | ● | ● |
| | Rod end nut | ● | ● | ● |
| Option | Single knuckle joint | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● |

* Knuckle pin and snap ring are shipped together with double knuckle joint.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | | |
|------------------|----------------|----------|----------|
| | 6 | 10 | 16 |
| Foot bracket | CJ-L006B | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F006B | CJ-F010B | CJ-F016B |

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 6 | BJ2-006 | Common for the types of D-C7/C8 and D-H7 |
| 10 | BJ2-010 | |
| 16 | BJ2-016 | |

[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available.

Use it in accordance with the operating environment.

(Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Weight

(g)

| Bore size (mm) | | 6 | 10 | 16 |
|--|--------------|----|----|----|
| Basic weight * | | 27 | 35 | 70 |
| Additional weight per each 15 mm of stroke | | 3 | 6 | 9 |
| Mounting bracket weight | Foot style | 16 | 16 | 40 |
| | Flange style | 5 | 5 | 15 |

* Mounting nut and rod end nut are included in the basic weight.

Calculation: (Example)

CJ2WL10-45

• Basic weight 35 (ø10)

• Additional weight 6/15 stroke

• Cylinder stroke 45 stroke

• Mounting bracket weight 16 (Foot style)
35 + 6/15 x 45 + 16 = 69 g

Theoretical Output

Refer to "Double acting cylinder" in Theoretical Output 1 of Technical data 3 on page 6-19-1.

In the case of the double rod style, the force at IN side will be its theoretical output.

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining but or to the rod cover body.
If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below.
ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m,
ø16: 10.8 to 11.8 N·m
- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring).
In particular, use a pair of ultra-mini pliers such as the Super Tool CSM-07A for removing and installing the snap ring on the ø10 cylinder.
- In the case of auto switch rail mounting style, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

Clean Series

10-CJ2W **Mounting style** **Bore size** **Stroke**

• Clean Series

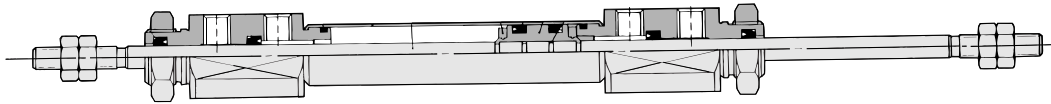
Air cylinder which is applicable for the system which discharges leakage from the rod section directly into the outside of clean room by relief port and making an actuator's rod section having a double seal construction.

Specifications

| | |
|----------------------------|--|
| Action | Double acting, Double rod |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.1 MPa |
| Cushion | Rubber bumper |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-15.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Basic style, Foot style, Flange style |

For details, refer to the separate catalog "Pneumatic Clean Series".

Construction



With Air Cushion

CJ2W **Mounting style** **Bore size** **Stroke** **A**

Air cushion •

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed.



Copper-free (For CRT manufacturing process)

20-CJ2W **Mounting style** **Bore size** **Stroke**

• Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube.

Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.



Specifications

| | |
|----------------------------|---|
| Action | Double acting, Double rod |
| Type | Non-lube |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.1 MPa |
| Piston speed | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Flange style |

Cushion Mechanism

| Bore size (mm) | Effective cushioning length (mm) | Kinetic energy absorbable (J) |
|----------------|----------------------------------|-------------------------------|
| 10 | 9.4 | 0.07 J |
| 16 | 9.4 | 0.18 J |

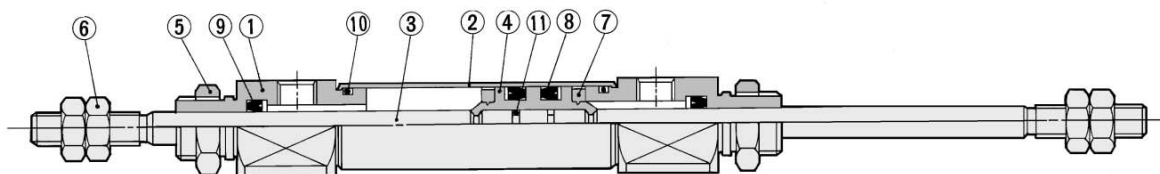
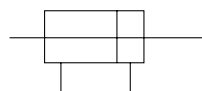
* For construction, refer to page 6-3-6.

Specifications

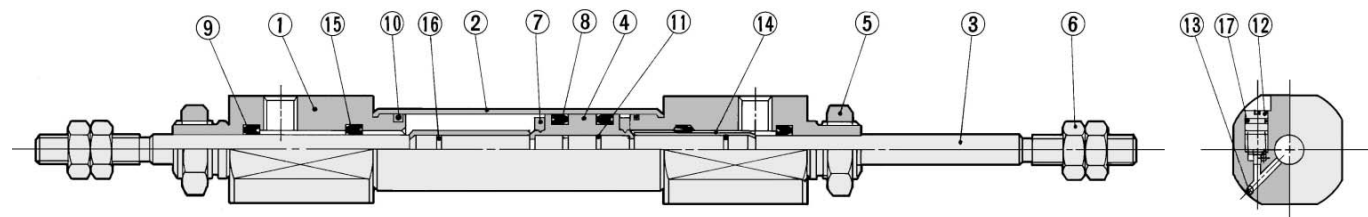
| | |
|----------------------------|--|
| Action | Double acting, Double rod |
| Bore size (mm) | 6, 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | <div> <div>ø6</div> <div>ø10, ø16</div> </div> 0.15 MPa 0.1 MPa |
| Cushion | Rubber bumper |
| Standard stroke (mm) | 15, 30, 45, 60 mm |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Basic style, Foot style, Flange style |

Series CJ2W

Construction (Not able to disassemble.)



With air cushion



Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Cylinder tube | Stainless steel | |
| ③ | Piston rod | Stainless steel | |
| ④ | Piston | Brass | |
| ⑤ | Mounting nut | Brass | Nickel plated |
| ⑥ | Rod end nut | Rolled steel | Nickel plated |
| ⑦ | Bumper | Urethane | |
| ⑧ | Piston seal | NBR | |
| ⑨ | Rod seal | NBR | |
| ⑩ | Tube gasket | NBR | |
| ⑪ | Piston gasket | NBR | |

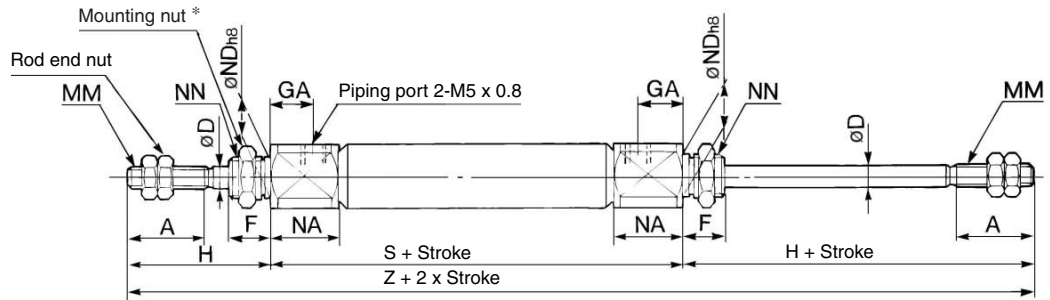
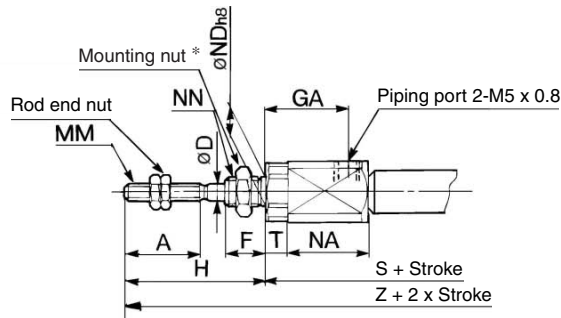
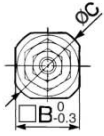
Dedicated for with Air Cushion Type

| No. | Description | Material | Note |
|-----|---------------------|-----------------|------|
| ⑫ | Cushion needle | Stainless steel | |
| ⑬ | Steel balls | Bearing steel | |
| ⑭ | Cushion ring | Brass | |
| ⑮ | Check seal | NBR | |
| ⑯ | Cushion ring gasket | NBR | |
| ⑰ | Needle seal | NBR | |

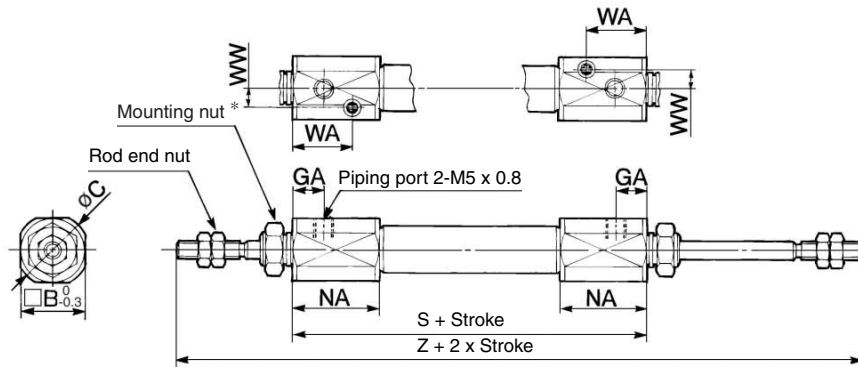
Basic Style (B)

CJ2WB Bore size Stroke

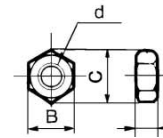
CJ2WB6 Rod cover



With air cushion: CJ2WB Bore size Stroke A



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GA | H | MM | NA | ND h8 | NN | S * | T | Z * |
|----------------|----|------|----|---|---|------|----|----------|------|-----------------------------------|-----------|------------|---|--------------|
| 6 | 15 | 12 | 14 | 3 | 8 | 14.5 | 28 | M3 x 0.5 | 16 | 6 ⁰ _{-0.018} | M6 x 1.0 | 61 (66) | 3 | 117 (122) |
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 28 | M4 x 0.7 | 12.5 | 8 ⁰ _{-0.022} | M8 x 1.0 | 49 | — | 105 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 28 | M5 x 0.8 | 12.5 | 10 ⁰ _{-0.022} | M10 x 1.0 | 50 | — | 106 |

With Air Cushion/Dimensions other than the table below are the same as the table above.

* () in S and Z dimensions: With auto switch

| Bore size (mm) | B | C | GA | NA | WA | WW | S | Z |
|----------------|------|----|-----|----|------|-----|----|-----|
| 10 | 15 | 17 | 7.5 | 21 | 14.5 | 4.5 | 66 | 122 |
| 16 | 18.3 | 20 | 7.5 | 21 | 14.5 | 5.5 | 67 | 123 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

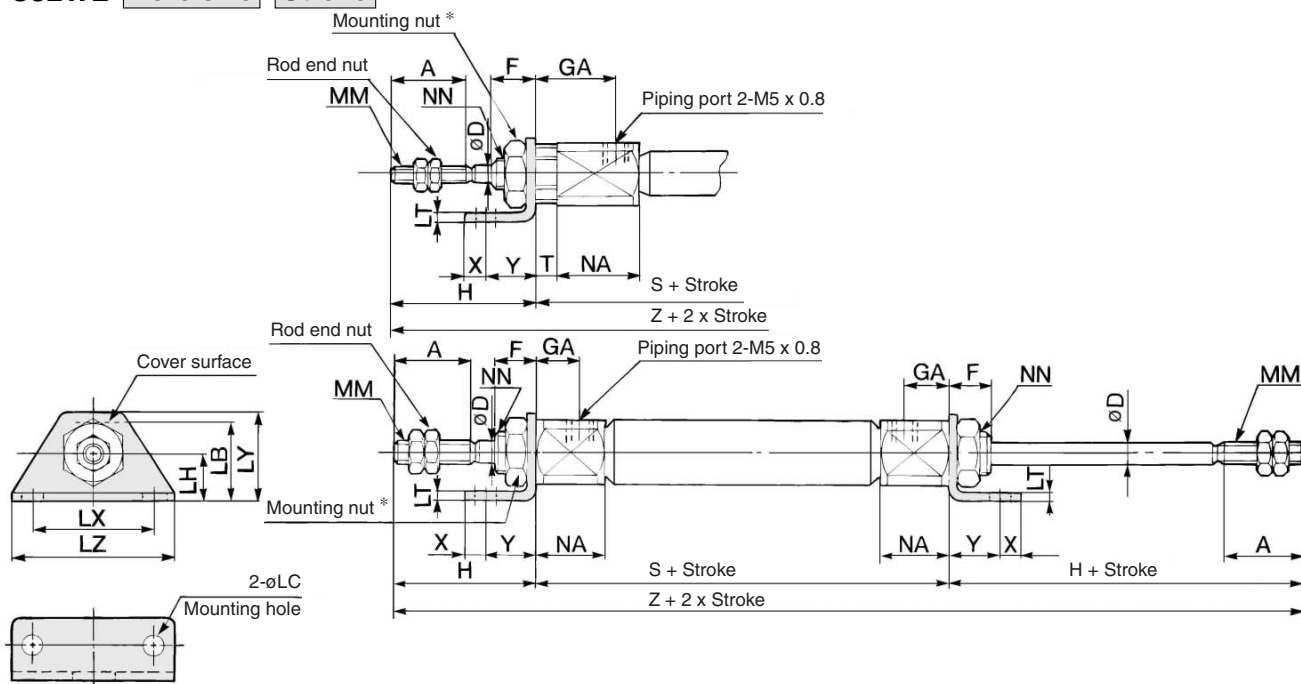
20-

Data

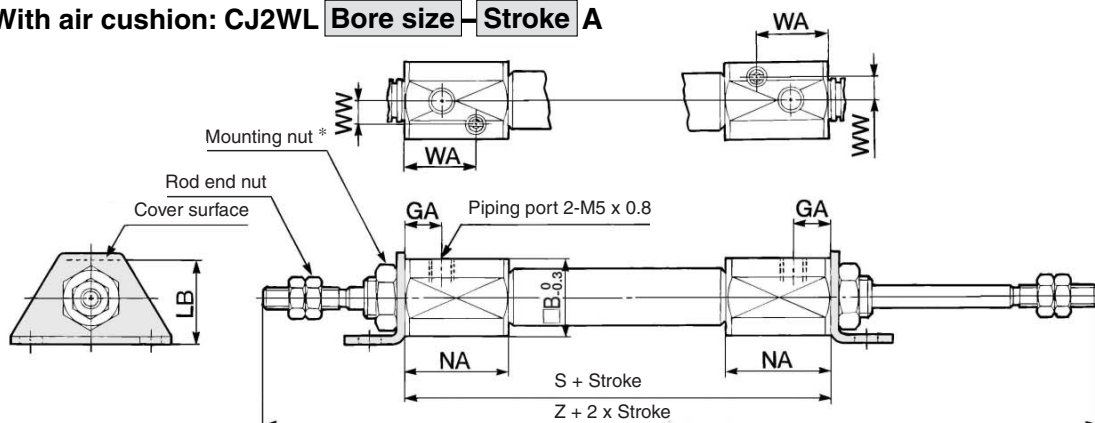
Series CJ2W

Foot Style (L)

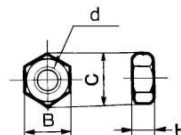
CJ2WL Bore size Stroke



With air cushion: CJ2WL Bore size Stroke A



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | D | F | GA | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NN | S* | T | X | Y | Z* |
|----------------|----|---|---|------|----|----|-----|----|-----|----|------|----|----------|------|-----------|------------|---|---|---|--------------|
| 6 | 15 | 3 | 8 | 14.5 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M3 x 0.5 | 16 | M6 x 1.0 | 61 (66) | 3 | 5 | 7 | 117 (122) |
| 10 | 15 | 4 | 8 | 8 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | M8 x 1.0 | 49 | — | 5 | 7 | 105 |
| 16 | 15 | 5 | 8 | 8 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | M10 x 1.0 | 50 | — | 6 | 9 | 106 |

With Air Cushion/Dimensions other than the table below are the same as the table above.

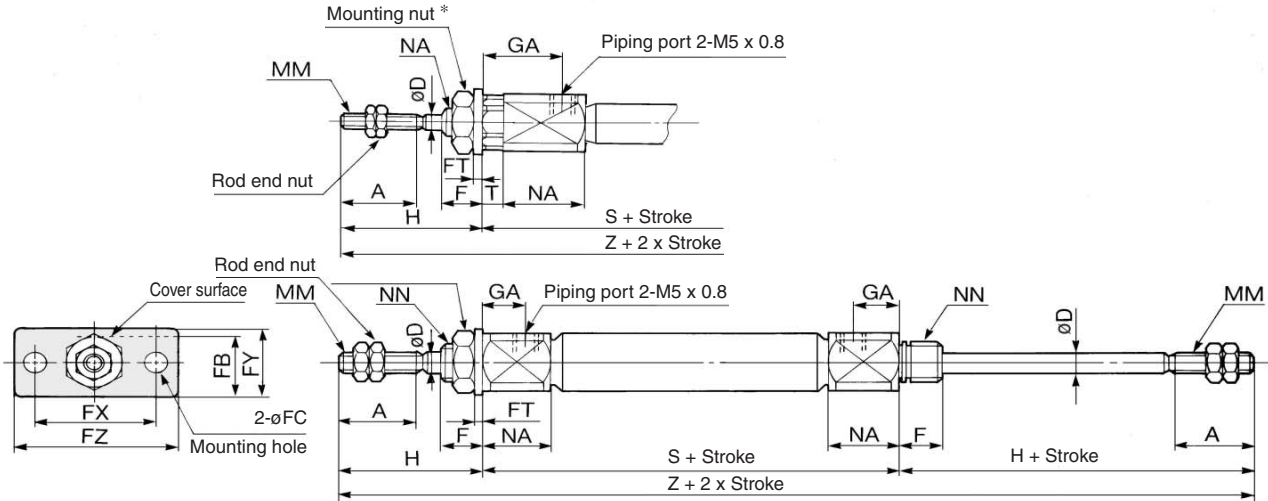
* () in S and Z dimensions: With auto switch

| Bore size (mm) | B | GA | LB | NA | WA | WW | S | Z |
|----------------|------|-----|------|----|------|-----|----|-----|
| 10 | 15 | 7.5 | 16.5 | 21 | 14.5 | 4.5 | 66 | 122 |
| 16 | 18.3 | 7.5 | 23 | 21 | 14.5 | 5.5 | 67 | 123 |

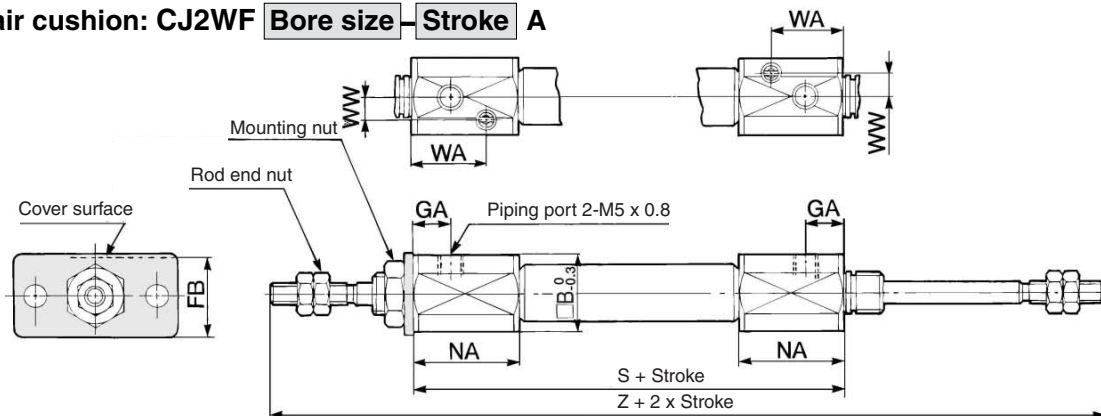
Air Cylinder: Standard Type Double Acting, Double Rod **Series CJ2W**

Flange Style (F)

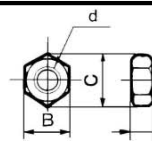
CJ2WF Bore size Stroke



With air cushion: CJ2WF Bore size Stroke A



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | D | F | FB | FC | FT | FX | FY | FZ | GA | H | MM | NA | NN | S* | T | Z* |
|----------------|----|---|---|----|-----|-----|----|----|----|------|----|----------|------|-----------|------------|---|--------------|
| 6 | 15 | 3 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 14.5 | 28 | M3 x 0.5 | 16 | M6 x 1.0 | 61 (66) | 3 | 117 (122) |
| 10 | 15 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 8 | 28 | M4 x 0.7 | 12.5 | M8 x 1.0 | 49 | — | 105 |
| 16 | 15 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 28 | M5 x 0.8 | 12.5 | M10 x 1.0 | 50 | — | 106 |

With Air Cushion/Dimensions other than the table below are the same as the table above.

* () in S and Z dimensions: With auto switch

| Bore size (mm) | B | FB | GA | NA | WA | WW | S | Z |
|----------------|------|------|-----|----|------|-----|----|-----|
| 10 | 15 | 14.5 | 7.5 | 21 | 14.5 | 4.5 | 66 | 122 |
| 16 | 18.3 | 19 | 7.5 | 21 | 14.5 | 5.5 | 67 | 123 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Air Cylinder: Standard Type Single Acting, Spring Return/Extend

Series CJ2

ø6, ø10, ø16

How to Order



| Spring return | | Mounting style | |
|---------------|---------------------------------|----------------|---------------------------------|
| B | Basic style | L | Basic style |
| L | Axial foot style | F | Rod side flange style |
| F | Rod side flange style | D | Double clevis style (Except ø6) |
| D | Double clevis style (Except ø6) | | |

| Bore size | |
|-----------|-------|
| 6 | 6 mm |
| 10 | 10 mm |
| 16 | 16 mm |

| Standard stroke (mm) | |
|----------------------|-----------------------------------|
| ø6 | 15, 30, 45, 60 |
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150 |

*Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
*When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-23.

| Action | |
|--------|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| Example | Rail mounting style | CDJ2B16-60S-A |
|---------|---------------------|---------------|
| | Band mounting style | CDJ2B10-45S-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

CJ2 L 16 45 S R

With auto switch

CDJ2 L 16 45 S R J79W



Built-in magnet

Port location on head cover

| Bore size (mm) | 6 | 10, 16 |
|----------------|------------------|-----------------------|
| Symbol | — | Perpendicular to axis |
| Nil | — | Perpendicular to axis |
| R | Axial foot style | Axial foot style |

* For configuration, refer to page 6-3-4.
* Single acting, Spring return (S), Clevis style is available only for 90° to the axis.
* Not applicable to single acting, spring extend (T).

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|--------------------------|--------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | Relay, PLC |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | |
| | Connector | | | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | |
| | | | | | Grommet | — | — | — | C73C | A73C | — | ● | ● | ● | ● | — | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | 12 V | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | ○ | | |
| | Connector | 2-wire | | | | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | | |
| | | Grommet | | 3-wire (NPN) | | | | 5 V, 12 V | H7C | J79C | — | ● | ● | ● | ● | — | |
| | 3-wire (PNP) | | | 12 V | | | | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | |
| | 2-wire | | | | | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | |
| | | | | | | | | | 2-wire | H7BW | F7BWV | J79W | ● | ● | ○ | — | |
| | With diagnostic output (2-color indication) | Grommet | | | | | | 4-wire (NPN) | | 5 V, 12 V | H7BA | — | F7BA | — | ● | ○ | |
| | | | | — | F7BAV | — | — | | ● | | ○ | — | — | | | | |
| | With diagnostic output (2-color indication) | Grommet | | 4-wire (NPN) | 5 V, 12 V | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | | | |

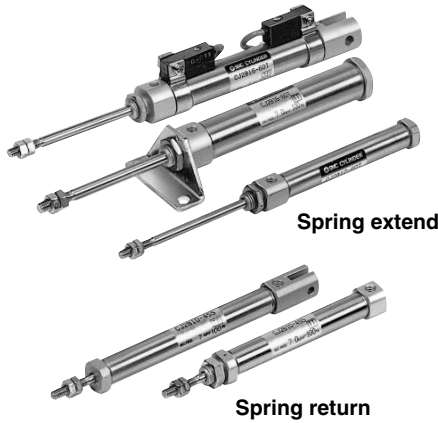
* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
• For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Standard Type

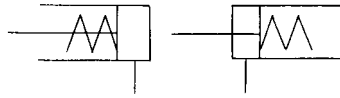
Single Acting, Single Rod, Spring Return/Extend Series CJ2



JIS Symbol

Single acting,
Spring return

Single acting,
Spring extend



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC22 | Fluoro rubber seals |
| -XC51 | With hose nipple |

Specifications

| Action | | Single acting, Spring return | Single acting, Spring extend |
|-------------------------------|----------|---|------------------------------|
| Fluid | | Air | |
| Proof pressure | | 1.05 MPa | |
| Maximum operating pressure | | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.2 MPa | 0.25 MPa |
| | ø10, ø16 | 0.15 MPa | |
| Ambient and fluid temperature | | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | | Rubber bumper * | |
| Lubrication | | Not required (Non-lube) | |
| Thread tolerance | | JIS Class 2 | |
| Stroke length tolerance | | +1.0 0 | |
| Piston speed | | 50 to 750 mm/s | |
| Allowable kinetic energy | ø6 | 0.012 J | |
| | ø10 | 0.035 J | |
| | ø16 | 0.090 J | |

* No freezing

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|-----------------------------------|
| 6 | 15, 30, 45, 60 |
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Spring Force

(N)

| Bore size (mm) | Retracted side | Extended side |
|----------------|----------------|---------------|
| 6 | 3.72 | 1.77 |
| 10 | 6.86 | 3.53 |
| 16 | 14.2 | 6.86 |

Minimum Stroke for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|---------------------------------------|--------------------------------------|------------------------------|------------------------------|
| Band mounting style (ø6, ø10, ø16) | D-C7□ D-C80 | 3 (Same side) | 90 |
| | | 3 (Different sides) | 55 |
| | | 2 (Same side) | 50 |
| | | 2 (Different sides) | 15 |
| | D-H7□ D-H7□W D-H7BAL D-H7NF | 1 | 10 |
| | | 3 (Same side) | 105 |
| | | 3 (Different sides) | 60 |
| | | 2 (Same side) | 60 |
| | | 2 (Different sides) | 15 |
| | D-C73C D-C80C D-H7C | 1 | 10 |
| | | 3 (Same side) | 105 |
| | | 3 (Different sides) | 65 |
| | | 2 (Same side) | 65 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|-----------------------------------|---------------------------------------|------------------------------|------------------------------|
| Rail mounting style (ø10, ø16) | D-A7□ D-A80 D-A73C D-A80C | 3 | 35 |
| | | 2 | 10 |
| | | 1 | 5 |
| | | 3 | 45 |
| | D-A7□H D-A80H | 2 | 10 |
| | | 1 | 5 |
| | D-A79W | 3 | 40 |
| | | 2 | 15 |
| | | 1 | 10 |
| | | 3 | 45 |
| | D-F7□ D-J79 | 2 | 5 |
| | | 1 | 5 |
| | | 3 | 30 |
| | D-F7□V D-J79C | 2 | 5 |
| | | 1 | 5 |
| | | 3 | 55 |
| | D-F7□W D-J79W D-F7BAL D-F79F | 2 | 15 |
| | | 1 | 10 |
| | | 3 | 40 |
| | | 2 | 15 |
| | D-F7□WV D-F7BAVL | 1 | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Weight/Spring Return (S)

(g)

| Bore size (mm) | | 6 | 10 | 16 |
|-------------------------|----------------------------------|----|----|-----|
| Basic weight * | 15 stroke | 11 | 28 | 63 |
| | 30 stroke | 16 | 35 | 80 |
| | 45 stroke | 18 | 44 | 102 |
| | 60 stroke | 23 | 53 | 124 |
| | 75 stroke | — | — | 145 |
| | 100 stroke | — | — | 188 |
| | 125 stroke | — | — | 224 |
| | 150 stroke | — | — | 250 |
| Mounting bracket weight | Axial foot style | 8 | 8 | 20 |
| | Rod side flange style | 5 | 5 | 15 |
| | Double clevis style (With pin) * | — | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2L10-45S

- Basic weight 44 (ø10-45 stroke)
 - Mounting bracket weight ... 8 (Axial foot style)
- 44 + 8 = 52 g

Weight/Spring Extend (T)

(g)

| Bore size (mm) | | 6 | 10 | 16 |
|-------------------------|----------------------------------|----|----|-----|
| Basic weight * | 15 stroke | 17 | 28 | 64 |
| | 30 stroke | 21 | 34 | 80 |
| | 45 stroke | 23 | 43 | 100 |
| | 60 stroke | 27 | 51 | 121 |
| | 75 stroke | — | — | 140 |
| | 100 stroke | — | — | 178 |
| | 125 stroke | — | — | 212 |
| | 150 stroke | — | — | 236 |
| Mounting bracket weight | Axial foot style | 8 | 8 | 20 |
| | Rod side flange style | 5 | 5 | 15 |
| | Double clevis style (With pin) * | — | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2L10-45T

- Basic weight 43 (ø10-45 stroke)
 - Mounting bracket weight ... 8 (Axial foot style)
- 43 + 8 = 51 g

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | | |
|------------------|----------------|----------|----------|
| | 6 | 10 | 16 |
| Foot bracket | CJ-L006B | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F006B | CJ-F010B | CJ-F016B |
| T-bracket * | — | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | |
|----------------|----------------------------------|--|
| 6 | BJ2-006 | Common for the types of D-C7/C8 and D-H7 |
| 10 | BJ2-010 | |
| 16 | BJ2-016 | |

[Mounting screws set made of stainless steel]
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

“D-H7BAL” switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, “BBA4” screws are attached.

Mounting Style and Accessory/For details, refer to page 6-3-13.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double * clevis style |
|--------------------|------------------------|-------------|------------------|-----------------------|-----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint. For the attached bracket weight, refer to page 6-3-4.

Theoretical Output

Refer to the “Single acting, Spring return cylinder” in Theoretical Output 1 of Technical data 3 on page 6-19-7. In the case of the spring extend style, the force at OUT side will be the ending force of the spring return, and that at the IN side will be the amount of the IN side force of the double acting style cylinder from which the beginning force of the spring return has been subtracted.

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut or to the rod cover body.
If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below.
ø6: 2.1 to 2.5 N·m, ø10: 5.9 to 6.4 N·m, ø16: 10.8 to 11.8 N·m
- In the case of a single acting cylinder, do not operate it in such a way that a load would be applied during the retraction of the piston rod of the spring return style, or during the extension of the piston rod of the spring extend style. The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod will not be able to retract to the end of the stroke.
- In the case of a single acting cylinder, a breather hole is provided in the cover surface. Make sure not to block this hole during installation, as this could lead to a malfunction.
- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring).
In particular, use a pair of ultra-mini pliers such as the Super Tool CSM-07A for removing and installing the snap ring on the ø10 cylinder.
- In the case of auto switch rail mounting style, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.

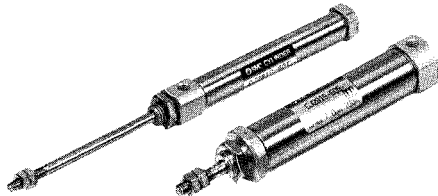
Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2**

Copper-free (For CRT manufacturing process)

20-CJ2 Mounting style Bore size Stroke Action Port location on head cover

Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.



Specifications

| Action | | Single acting, Spring return | Single acting, Spring extend |
|----------------------------|----------|---|------------------------------|
| Bore size (mm) | | 6, 10, 16 | |
| Maximum operating pressure | | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.2 MPa | 0.25 MPa |
| | ø10, ø16 | 0.15 MPa | |
| Cushion | | Rubber bumper | |
| Standard stroke (mm) | | Same as standard type. (Refer to page 6-3-23.) | |
| Auto switch | | Mountable (Band mounting style) | |
| Mounting | | Basic style, Axial foot style, Rod side flange style, Double clevis style (Except ø6) | |

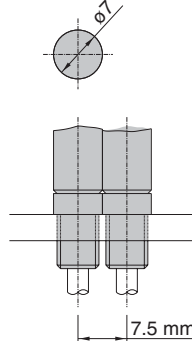
Short Pitch Mounting Style/Single Acting, Spring Return

CJ2B6 – Stroke **SU4- X773**

Short pitch mounting style

Mounting pitch is shortened when using in parallel.

- External dimensions of rod cover and head cover is changed to ø7.
- Overall length is shorten by adopting head cover integrated with barb fitting.

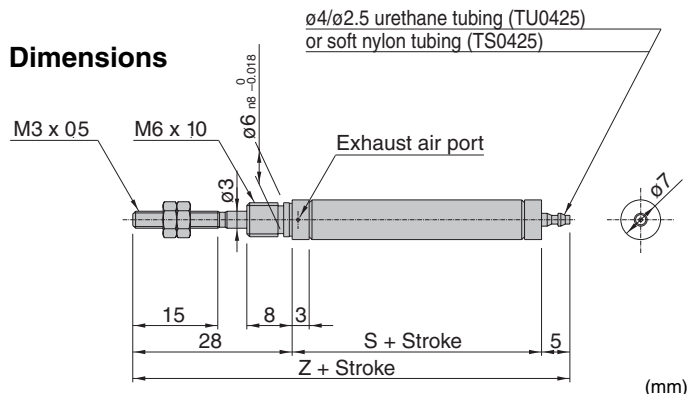


Note) Directly mounted with cylinder mounting thread.

Specifications

| | |
|--------------------------|--|
| Bore size (mm) | 6 |
| Action | Single acting, Spring return |
| Operating pressure range | 0.2 to 0.7 MPa |
| Connection size | With ø4 barb fitting (for soft tubing) |
| Connecting port location | Head cover/Axial foot |
| Stroke (mm) | 5 to 60 |
| Auto switch | None |

Dimensions

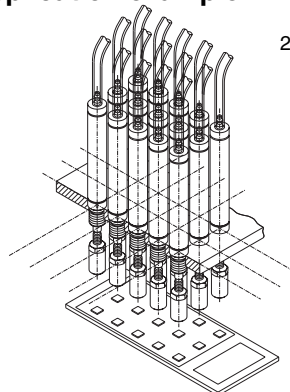


| Stroke | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 |
|----------|---------|----------|----------|----------|
| S | 30.5 | 39.5 | 43.5 | 57.5 |
| Z | 63.5 | 72.5 | 76.5 | 90.5 |

Note)

- When installing cylinder, make sure that exhaust port for air on rod cover should not be blocked.
- When a cylinder is mounted, apply thread-locking adhesive on the threaded part and secure the external diameter of a rod cover by plier, etc. for mounting.

Application example

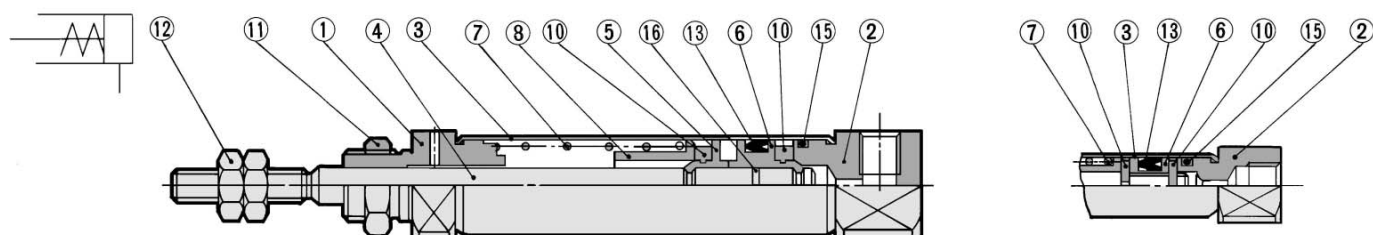


Verification of push button actuation for mobile phone, etc.

Series CJ2

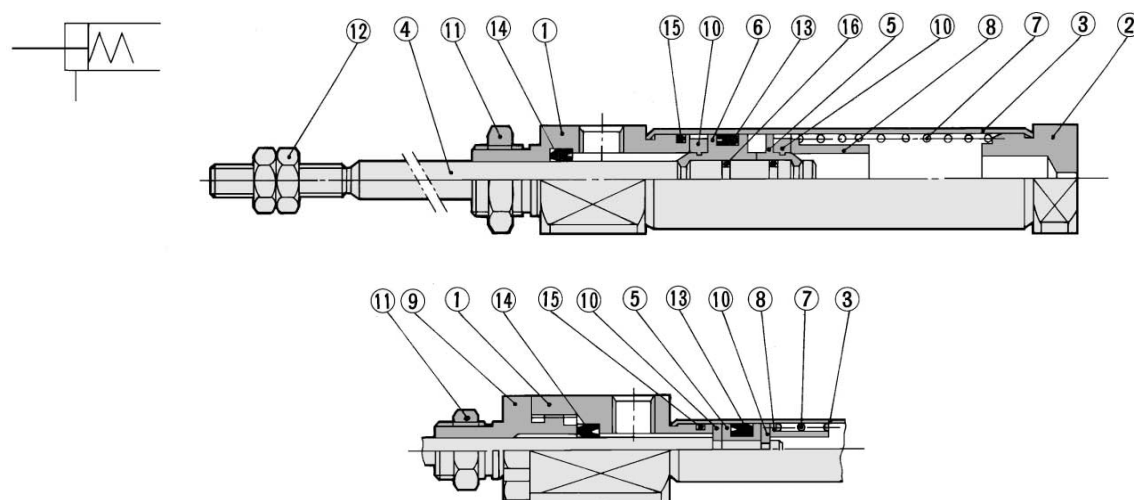
Construction (Not able to disassemble.)

Single acting, Spring return



CJ2□6 Piston/Head cover

Single acting, Spring extend



CJ2□6 Piston/Rod cover

Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|----------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston A | Brass | |
| ⑥ | Piston B | Brass | |
| ⑦ | Return spring | Piano wire | Zinc chromated |
| ⑧ | Spring seat | Brass | |

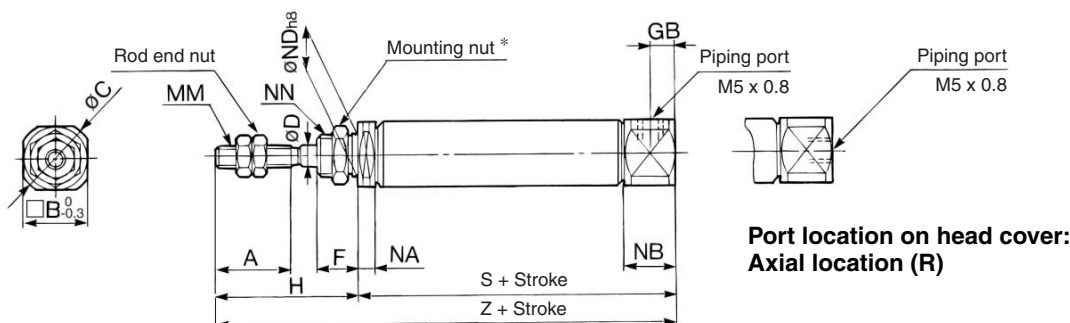
| No. | Description | Material | Note |
|-----|---------------|----------------|-----------------------------------|
| ⑨ | Seal retainer | Aluminum alloy | Clear anodized (ø6 spring extend) |
| ⑩ | Bumper | Urethane | |
| ⑪ | Mounting nut | Brass | Nickel plated |
| ⑫ | Rod end nut | Rolled steel | Nickel plated |
| ⑬ | Piston seal | NBR | |
| ⑭ | Rod seal | NBR | |
| ⑮ | Tube gasket | NBR | |
| ⑯ | Piston gasket | NBR | |

Air Cylinder: Standard Type

Single Acting, Single Rod, Spring Return/Extend **Series CJ2**

Single Acting, Spring Return: Basic Style (B)

CJ2B Bore size Stroke S Port location on head cover



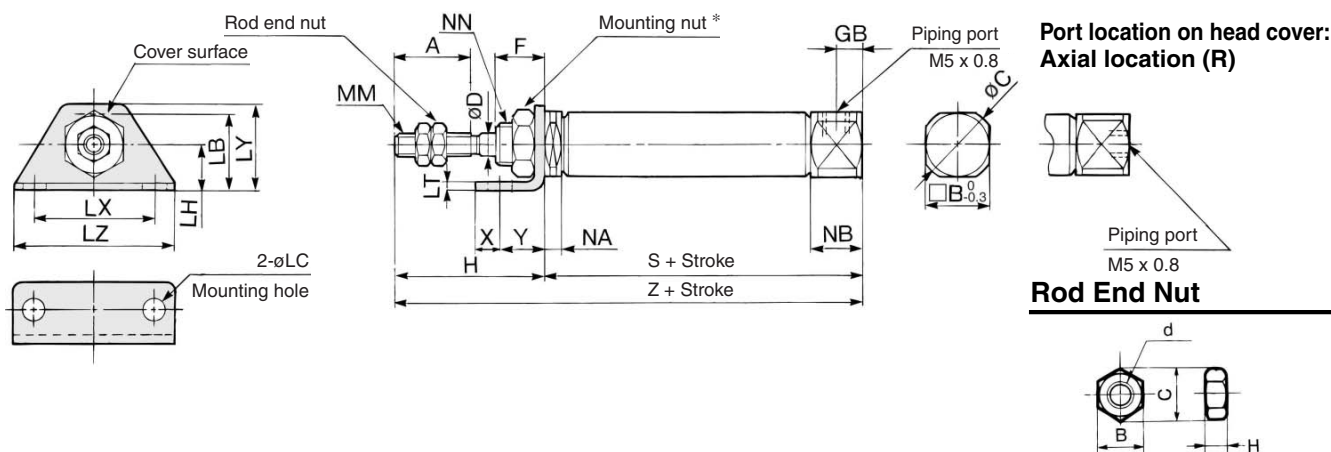
* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GB | H | MM | NA | NB | ND _{h8} | NN | S * | | | | | | | | Z * | | | | | | | |
|-------------------|----|------|----|---|---|----|----|----------|-----|-----|----------------------|-----------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 6 | 15 | 8 | 9 | 3 | 8 | — | 28 | M3 x 0.5 | 3 | 7 | 6 _{-0.018} | M6 x 1.0 | 34.5 (39.5) | 43.5 (48.5) | 47.5 (52.5) | 61.5 (66.5) | — | — | — | — | 62.5 (67.5) | 71.5 (76.5) | 75.5 (80.5) | 89.5 (94.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 5 | 28 | M4 x 0.7 | 5.5 | 9.5 | 8 _{-0.022} | M8 x 1.0 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 5 | 28 | M5 x 0.8 | 5.5 | 9.5 | 10 _{-0.022} | M10 x 1.0 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

* () in S and Z dimensions: With auto switch

Single Acting, Spring Return: Axial Foot Style (L)

CJ2L Bore size Stroke S Port location on head cover



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|-------------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

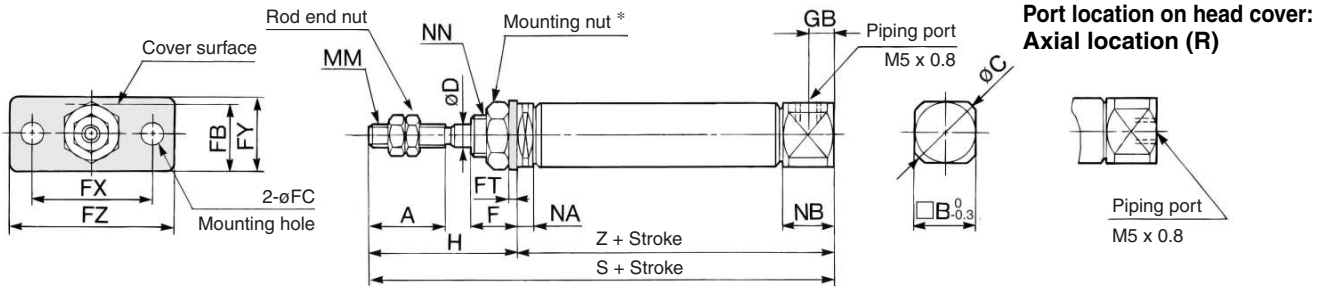
| Bore size (mm) | A | B | C | D | F | GB | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y | S * | | | | | | | | Z * | | | | | | | |
|-------------------|----|------|----|---|---|----|----|----|-----|----|-----|----|------|----|----------|-----|-----|-----------|---|---|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 6 | 15 | 8 | 9 | 3 | 8 | — | 28 | 13 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M3 x 0.5 | 3 | 7 | M6 x 1.0 | 5 | 7 | 34.5 (39.5) | 43.5 (48.5) | 47.5 (52.5) | 61.5 (66.5) | — | — | — | — | 62.5 (67.5) | 71.5 (76.5) | 75.5 (80.5) | 89.5 (94.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 5 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 5.5 | 9.5 | M8 x 1.0 | 5 | 7 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 5 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 5.5 | 9.5 | M10 x 1.0 | 6 | 9 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

* () in S and Z dimensions: With auto switch

Series CJ2

Single Acting, Spring Return: Rod Side Flange Style (F)

CJ2F Bore size Stroke S Port location on head cover



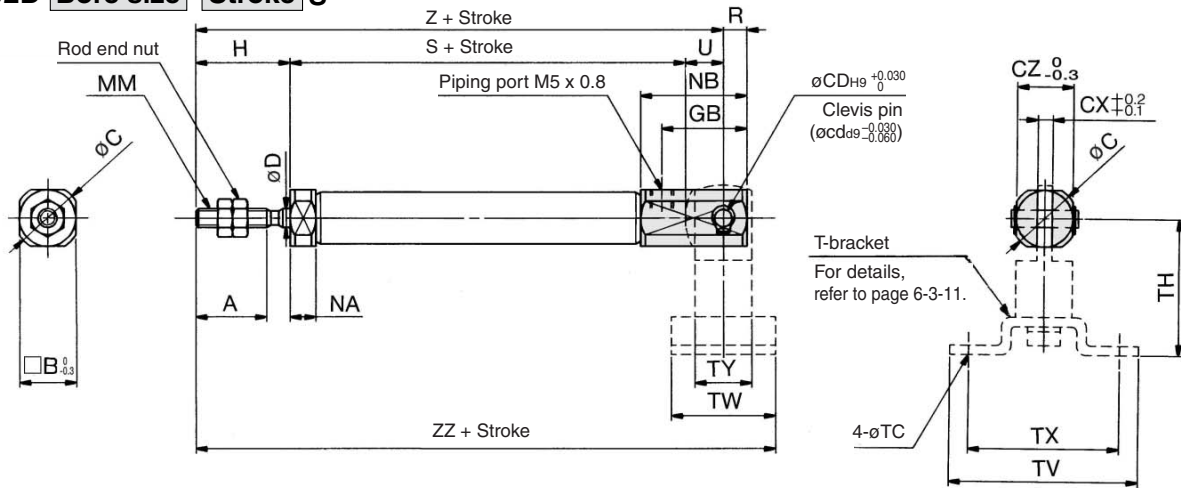
* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GB | H | MM | NA | NB | NN | S * | | | | | | | | Z * | | | | | | | |
|-------------------|----|------|----|---|---|----|-----|-----|----|----|----|----|----|----------|-----|-----|-----------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 6 | 15 | 8 | 9 | 3 | 8 | 11 | 4.5 | 1.6 | 24 | 14 | 32 | — | 28 | M3 x 0.5 | 3 | 7 | M6 x 1.0 | 34.5 (39.5) | 43.5 (48.5) | 47.5 (52.5) | 61.5 (66.5) | — | — | — | — | 62.5 (67.5) | 71.5 (76.5) | 75.5 (80.5) | 89.5 (94.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 5 | 28 | M4 x 0.7 | 5.5 | 9.5 | M8 x 1.0 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 5 | 28 | M5 x 0.8 | 5.5 | 9.5 | M10 x 1.0 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

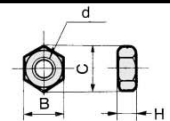
* () in S and Z dimensions: With auto switch

Single Acting, Spring Return: Double Clevis Style (D)

CJ2D Bore size Stroke S



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|-------------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | B | C | CD (cd) | CX | CZ | D | GB | H | MM | NA | NB | R | U | S | | | | | | | | Z | | | | | | | |
|-------------------|----|------|----|------------|-----|------|---|----|----|----------|-----|------|---|----|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 10 | 15 | 12 | 14 | 3.3 | 3.2 | 12 | 4 | 18 | 20 | M4 x 0.7 | 5.5 | 22.5 | 5 | 8 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 6.5 | 18.3 | 5 | 23 | 20 | M5 x 0.8 | 5.5 | 27.5 | 8 | 10 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 84 | 96 | 108 | 114 | 138 | 156 | 168 |

T-bracket Dimensions

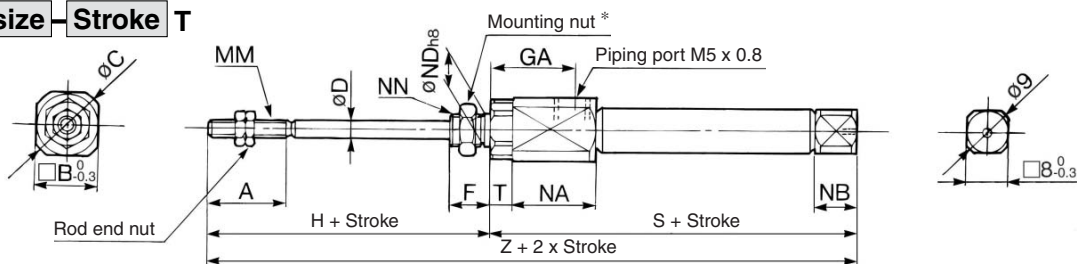
| Bore size (mm) | ZZ | | | | | | | | Bore size (mm) | TC | TH | TV | TW | TX | TY |
|-------------------|------------|-------------|-------------|-------------|-------------|--------------|---------------|---------------|-------------------|-----|----|----|----|----|----|
| 10 | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 84.5 | 92 | 104 | 116 | — | — | — | — | 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2**

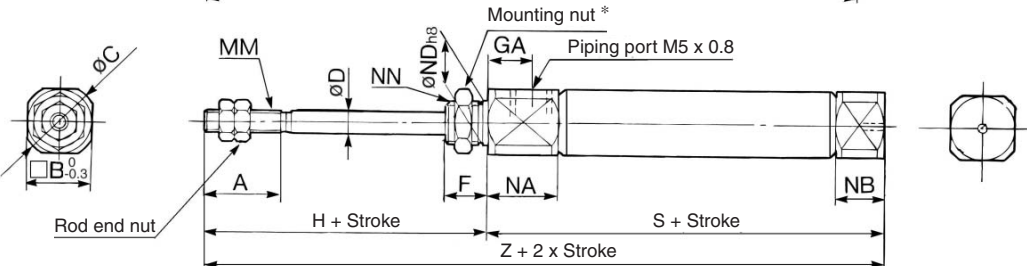
Single Acting, Spring Extend: Basic Style (B)

CJ2B Bore size — Stroke T

CJ2B6



CJ2B10/16



* For details of the mounting nut, refer to page 6-3-11.

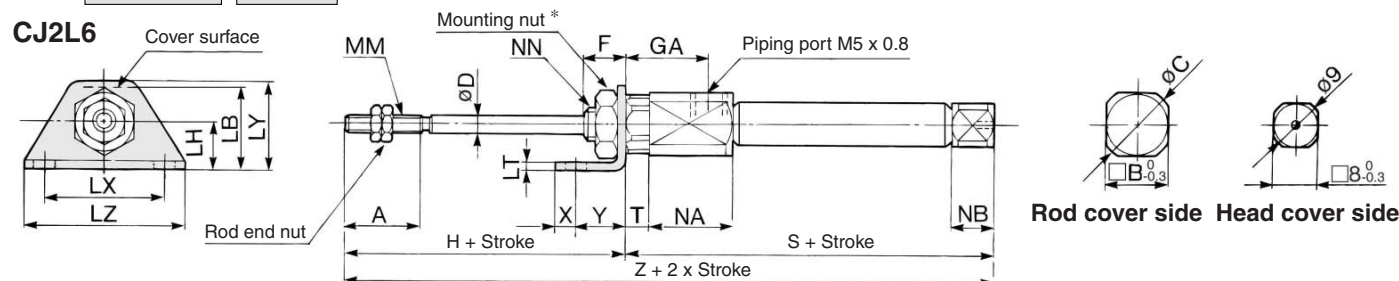
| Bore size (mm) | A | B | C | D | F | GA | H | MM | NN | NA | NB | ND h8 | T | S * | | | | | | | | Z * | | | | | | | |
|-------------------|----|------|----|---|---|------|----|----------|-----------|------|-----|-----------------------------------|---|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|----------------|----------------|----------------|------------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 6 | 15 | 12 | 14 | 3 | 8 | 14.5 | 28 | M3 x 0.5 | M6 x 1.0 | 16 | 3 | 6 ⁰ _{-0.018} | 3 | 46.5 (51.5) | 55.5 (60.5) | 59.5 (64.5) | 73.5 (78.5) | — | — | — | — | 74.5 (79.5) | 83.5 (88.5) | 87.5 (92.5) | 101.5 (106.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 28 | M4 x 0.7 | M8 x 1.0 | 12.5 | 5.5 | 8 ⁰ _{-0.022} | — | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 28 | M5 x 0.8 | M10 x 1.0 | 12.5 | 5.5 | 10 ⁰ _{-0.022} | — | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

* () in S and Z dimensions: With auto switch

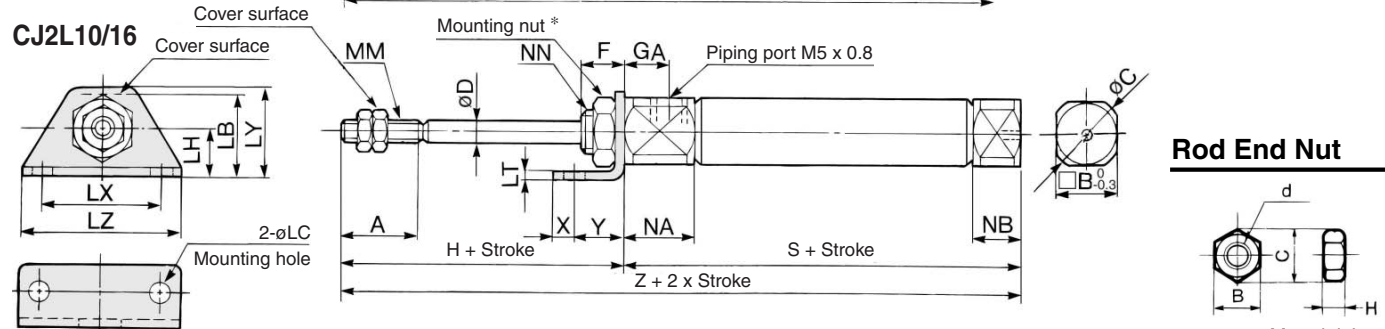
Single Acting, Spring Extend: Axial Foot Style (L)

CJ2L Bore size — Stroke T

CJ2L6



CJ2L10/16



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|-----------------|-------------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

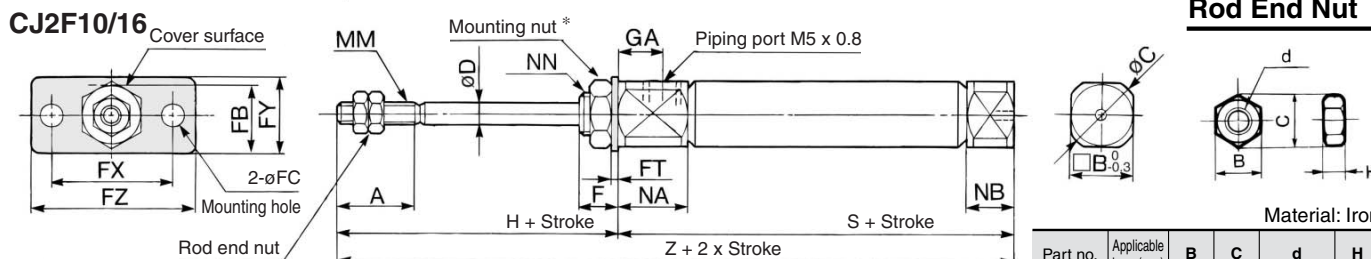
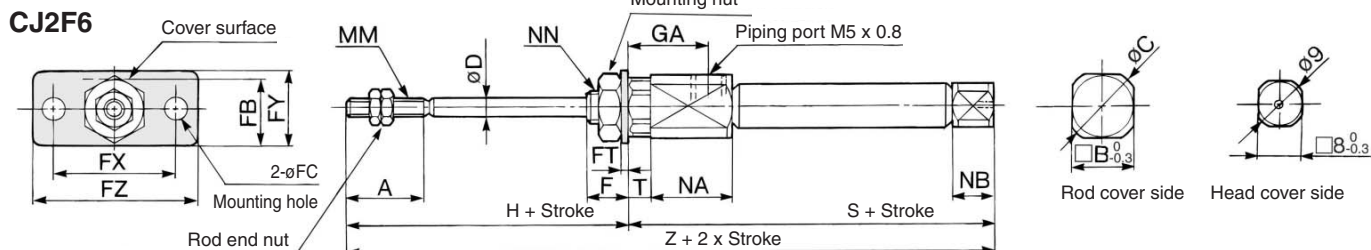
| Bore size (mm) | A | B | C | D | F | GA | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | T | X | Y | S * | | | | | | | | Z * | | | | | | | |
|-------------------|----|------|----|---|---|------|----|----|-----|----|-----|----|------|----|----------|------|-----|-----------|---|---|---|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|----------------|----------------|----------------|------------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 6 | 15 | 12 | 14 | 3 | 8 | 14.5 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M3 x 0.5 | 16 | 3 | M6 x 1.0 | 3 | 5 | 7 | 46.5 (51.5) | 55.5 (60.5) | 59.5 (64.5) | 73.5 (78.5) | — | — | — | — | 74.5 (79.5) | 83.5 (88.5) | 87.5 (92.5) | 101.5 (106.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 28 | 15 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 12.5 | 5.5 | M8 x 1.0 | — | 5 | 7 | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 5.5 | M10 x 1.0 | — | 6 | 9 | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

* () in S and Z dimensions: With auto switch

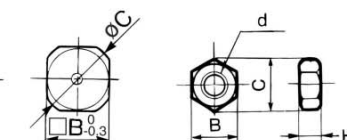
Series CJ2

Single Acting, Spring Extend: Rod Side Flange Style (F)

CJ2F Bore size — Stroke T



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|-----|-----|----------|-----|
| NTJ-006A | 6 | 5.5 | 6.4 | M3 x 0.5 | 2.4 |
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

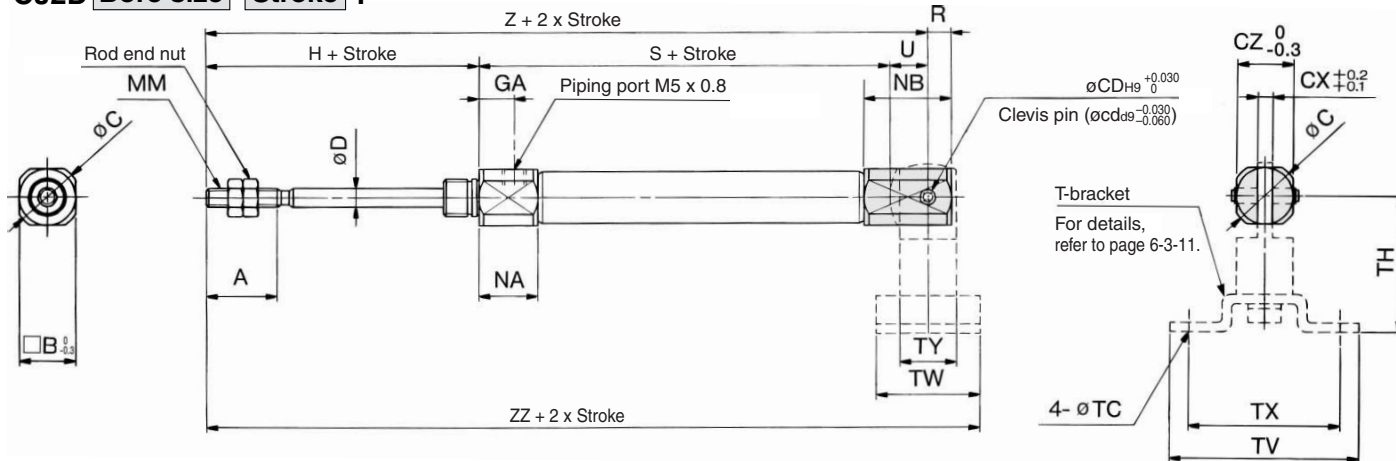
* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GA | H | MM | NANB | NN | T | S* | | | | | | | | Z* | | | | | | | | |
|-------------------|----|------|----|---|---|----|-----|-----|----|----|----|------|----|----------|------|-----|-----------|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|---------------|----------------|----------------|----------------|------------------|-----------------|------------------|------------------|-----|
| | | | | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | |
| 6 | 15 | 12 | 14 | 3 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 14.5 | 28 | M3 x 0.5 | 16 | 3 | M6 x 1.0 | 3 | 46.5 (51.5) | 55.5 (60.5) | 59.5 (64.5) | 73.5 (78.5) | — | — | — | — | 74.5 (79.5) | 83.5 (88.5) | 87.5 (92.5) | 101.5 (106.5) | — | — | — | — |
| 10 | 15 | 12 | 14 | 4 | 8 | 13 | 4.5 | 1.6 | 24 | 14 | 32 | 8 | 28 | M4 x 0.7 | 12.5 | 5.5 | M8 x 1.0 | — | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 28 | M5 x 0.8 | 12.5 | 5.5 | M10 x 1.0 | — | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

*() in S and Z dimensions: With auto switch

Single Acting, Spring Extend: Double Clevis Style (D)

CJ2D Bore size — Stroke T



* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | B | C | CD (cd) | CX | CZ | D | GA | H | MM | NA | NB | R | U | S | | | | | | | | Z | | | | | | | |
|-------------------|----|------|----|------------|-----|------|---|----|----|----------|------|------|---|----|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| | | | | | | | | | | | | | | | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 10 | 15 | 12 | 14 | 3.3 | 3.2 | 12 | 4 | 8 | 28 | M4 x 0.7 | 12.5 | 18.5 | 5 | 8 | 48.5 | 56 | 68 | 80 | — | — | — | — | 84.5 | 92 | 104 | 116 | — | — | — | — |
| 16 | 15 | 18.3 | 20 | 5 | 6.5 | 18.3 | 5 | 8 | 28 | M5 x 0.8 | 12.5 | 23.5 | 8 | 10 | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 86.5 | 95 | 107 | 119 | 125 | 149 | 167 | 179 |

T-bracket Dimensions

| Bore size (mm) | ZZ | | | | | | | |
|----------------|------------|-------------|-------------|-------------|-------------|--------------|---------------|---------------|
| | 5 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| 10 | 95.5 | 103 | 115 | 127 | — | — | — | — |
| 16 | 100.5 | 109 | 121 | 133 | 139 | 163 | 181 | 193 |

| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |

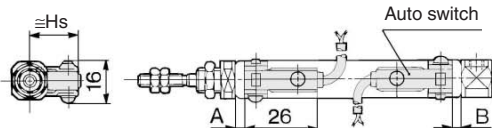
Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2**

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height: Single Acting, Spring Return (S)

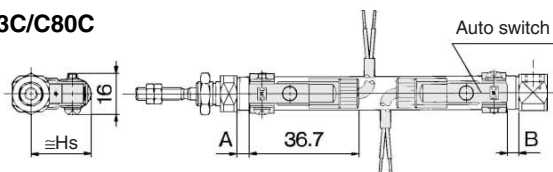
For the operating range of auto switch, refer to page 6-3-13.

Reed switch <Band mounting style>

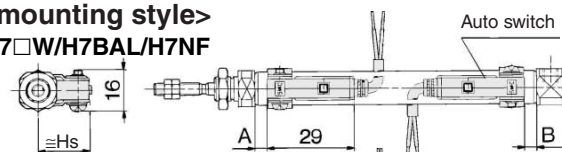
D-C7□/C80



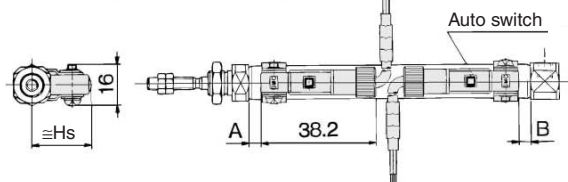
D-C73C/C80C



Solid state switch <Band mounting style> D-H7□/H7□W/H7BAL/H7NF

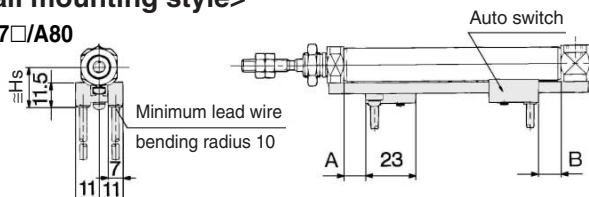


D-H7C

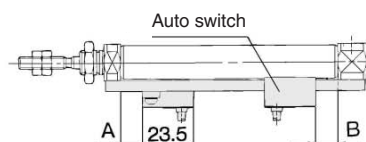
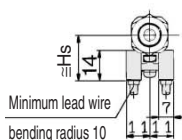


<Rail mounting style>

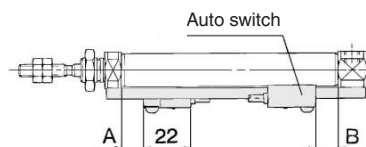
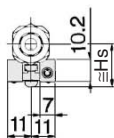
D-A7□/A80



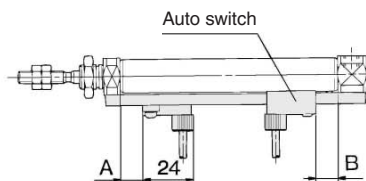
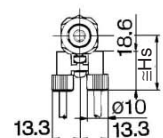
D-A79W



D-A7□H/A80H

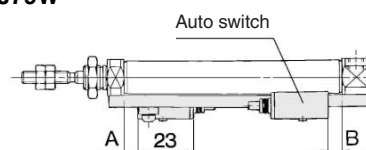
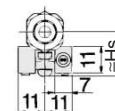


D-A73C/A80C

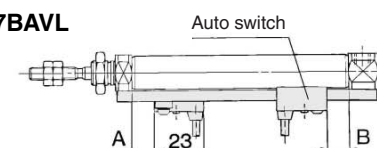
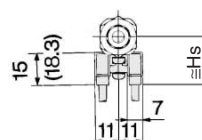


<Rail mounting style>

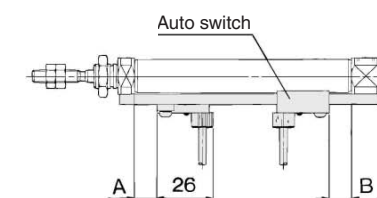
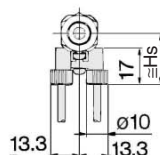
D-F7□/J79, D-F7□W, D-J79W
D-F79F, D-F7BAL



D-F7□V, D-F7□WV, D-F7BAVL



D-J79C



Auto Switch Mounting Height

| Auto switch model | Bore size (mm) | $\approx H_s$ |
|---|----------------|---------------|
| D-C7□/C80 D-H7□/H7□W D-H7NF/H7BAL | 6 | 15 |
| | 10 | 17 |
| | 16 | 20.5 |
| D-C73C D-C80C | 6 | 17.5 |
| | 10 | 19.5 |
| | 16 | 23 |
| D-H7C | 6 | 18 |
| | 10 | 20 |
| | 16 | 23.5 |
| D-A7 D-A80 | 10 | 16.5 |
| | 16 | 19.5 |
| D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F79F/J79C D-F7BAL D-F7BAVL | 10 | 17.5 |
| | 16 | 20.5 |
| D-A73C/A80C | 10 | 23.5 |
| | 16 | 26.5 |
| D-F7□V/F7BAVL D-F7□WV | 10 | 20 |
| | 16 | 23 |
| D-J79C | 10 | 23 |
| | 16 | 26 |
| D-A79W | 10 | 19 |
| | 16 | 22 |

Proper Auto Switch Mounting Position/Spring Return

| Auto switch model | Bore size (mm) | A dimension | | | | | | | | B |
|--|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----|
| | | 10 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st | |
| D-C7□/C80 D-C73C D-C80C | 6 | 8.5 | 17.5 | 21.5 | 35.5 | — | — | — | — | 2 |
| | 10 | 9 | 16.5 | 28.5 | 40.5 | — | — | — | — | 2.5 |
| | 16 | 8.5 | 17 | 29 | 41 | 47 | 71 | 89 | 101 | 3 |
| D-H7□/H7C D-H7□W/H7BAL D-H7NF | 6 | 7.5 | 16.5 | 20.5 | 34.5 | — | — | — | — | 1 |
| | 10 | 8 | 15.5 | 27.5 | 39.5 | — | — | — | — | 1.5 |
| | 16 | 7.5 | 16 | 28 | 40 | 46 | 70 | 88 | 100 | 2 |
| D-A7□/A80 | 10 | 9.5 | 17 | 29 | 41 | — | — | — | — | 3 |
| | 16 | 9 | 17.5 | 29.5 | 41.5 | 47.5 | 71.5 | 89.5 | 101.5 | 3.5 |
| D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F/J79C D-F7BAL D-F7BAVL | 10 | 10 | 17.5 | 29.5 | 41.5 | — | — | — | — | 3.5 |
| | 16 | 9.5 | 18 | 30 | 42 | 48 | 72 | 90 | 102 | 4 |
| | 10 | 7 | 14.5 | 26.5 | 38.5 | — | — | — | — | 0.5 |
| | 16 | 6.5 | 15 | 27 | 39 | 45 | 69 | 87 | 99 | 1 |

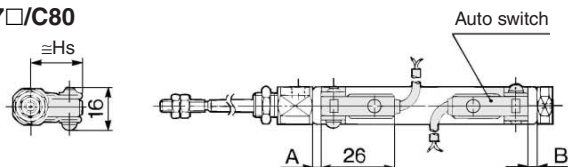
Series CJ2

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height: Single Acting, Spring Extend (T)

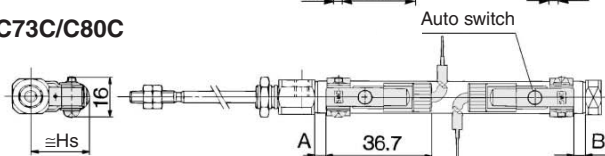
For the operating range of auto switch, refer to page 6-3-13.

Reed switch <Band mounting style>

D-C7□/C80

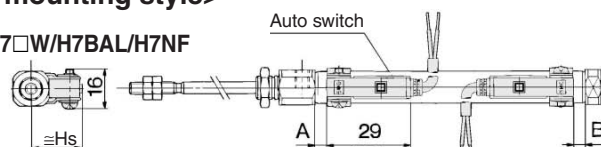


D-C73C/C80C

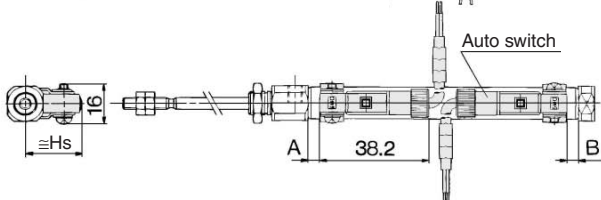


Solid state switch <Band mounting style>

D-H7□/H7□W/H7BAL/H7NF

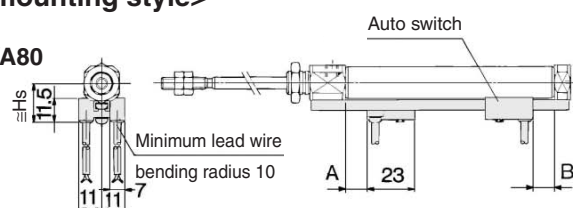


D-H7C

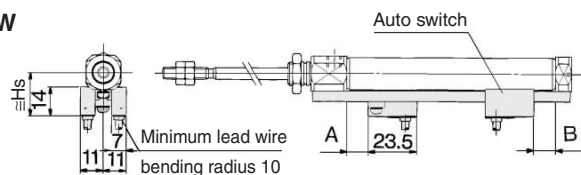


<Rail mounting style>

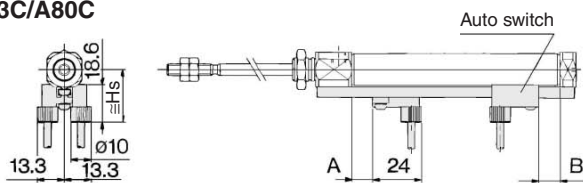
D-A7□/A80



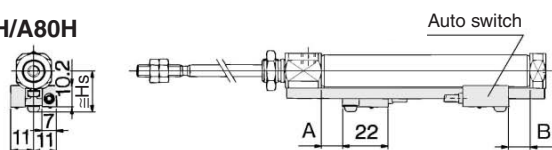
D-A79W



D-A73C/A80C

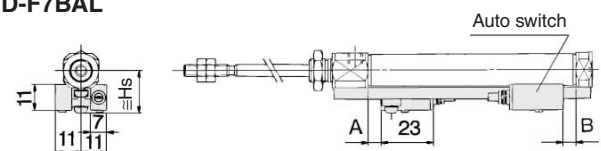


D-A7□H/A80H

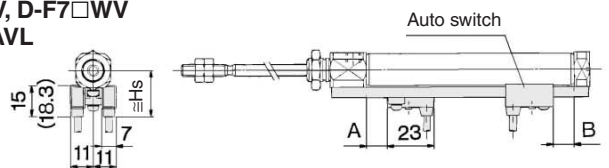


<Rail mounting style>

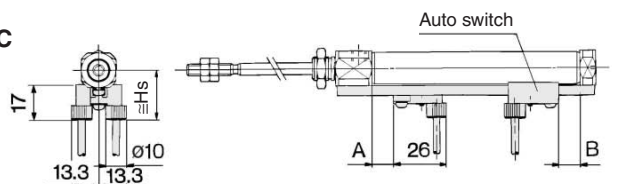
D-F7□/J79, D-F7□W, D-J79W
D-F79F, D-F7BAL



D-F7□V, D-F7□WV
D-F7BAVL



D-J79C



Auto Switch Mounting Height

| Auto switch model | Bore size (mm) | ≥Hs |
|---|----------------|------|
| D-C7□/C80 D-H7□/H7□W D-H7NF/H7BAL | 6 | 15 |
| | 10 | 17 |
| | 16 | 20.5 |
| D-C73C D-C80C | 6 | 17.5 |
| | 10 | 19.5 |
| | 16 | 23 |
| D-H7C | 6 | 18 |
| | 10 | 20 |
| | 16 | 23.5 |
| D-A7□ D-A80 | 10 | 16.5 |
| | 16 | 19.5 |
| D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F/J79C D-F7BAL D-F7BAVL | 10 | 17.5 |
| | 16 | 20.5 |
| D-A73C D-A80C | 10 | 23.5 |
| | 16 | 26.5 |
| D-F7□V/F7BAVL D-F7□WV | 10 | 20 |
| | 16 | 23 |
| D-J79C | 10 | 23 |
| | 16 | 26 |
| D-A79W | 10 | 19 |
| | 16 | 22 |

Proper Auto Switch Mounting Position/Spring Extend


| Auto switch model | Bore size (mm) | All stroke | B dimension | | | | | | | |
|--|----------------|------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|--------------------------|--------------------------|
| | | | 10 to 15 st | 16 to 30 st | 31 to 45 st | 46 to 60 st | 61 to 75 st | 76 to 100 st | 101 to 125 st | 126 to 150 st |
| D-C7□/C80 | 6 | 2 | 8.5 | 17.5 | 21.5 | 35.5 | — | — | — | — |
| D-C73C | 10 | 2.5 | 9 | 16.5 | 28.5 | 40.5 | — | — | — | — |
| D-C80C | 16 | 3 | 8.5 | 17 | 29 | 41 | 47 | 71 | 89 | 101 |
| D-H7□/H7C | 6 | 1 | 7.5 | 16.5 | 20.5 | 34.5 | — | — | — | — |
| D-H7□W/H7BAL | 10 | 1.5 | 8 | 15.5 | 27.5 | 39.5 | — | — | — | — |
| D-H7NF | 16 | 2 | 7.5 | 16 | 28 | 40 | 46 | 70 | 88 | 100 |
| D-A7□/A80 | 10 | 3 | 9.5 | 17 | 29 | 41 | — | — | — | — |
| | 16 | 3.5 | 9 | 17.5 | 29.5 | 41.5 | 47.5 | 71.5 | 87.5 | 101.5 |
| D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F/J79C D-F7BAL D-F7BAVL | 10 | 3.5 | 10 | 17.5 | 29.5 | 41.5 | — | — | — | — |
| | 16 | 4 | 9.5 | 18 | 30 | 42 | 48 | 72 | 90 | 102 |
| D-A79W | 10 | 0.5 | 7 | 14.5 | 26.5 | 38.5 | — | — | — | — |
| | 16 | 1 | 6.5 | 15 | 27 | 39 | 45 | 69 | 87 | 99 |

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod

Series CJ2K

ø10, ø16

How to Order



Bore size

| | |
|-----------|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Mounting style

| | |
|----------|-----------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style |

Standard stroke (mm)

| | |
|------------|---|
| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-34.

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting style) or "B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2KB16-60-A |
| | Band mounting style | CDJ2KB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

With auto switch

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |


* For configuration, refer to page 6-3-34.
* Double clevis style is only available for being perpendicular to axis.

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).
* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |



Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|--------------------------|---------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| | | | | | | | | Perpendicular | In-line | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | Relay, PLC | |
| | | 2-wire | | 24 V | | — | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | |
| | With diagnostic output (2-color indication) | | | | Connector | 2-wire | — | — | C73 | A73 | A73H | ● | ● | ● | — | — | | — |
| | | C73C | | A73C | | | | | — | ● | ● | ● | ● | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | 12 V | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | ○ | | | |
| | Connector | 2-wire | | | | 5 V, 12 V | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | — | | |
| | | 2-wire | | H7C | | | | J79C | — | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | |
| | Water resistant (2-color indication) | Grommet | | 2-wire | | 12 V | | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | — | | |
| | | | | 2-wire | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | | |
| | With diagnostic output (2-color indication) | Grommet | | 4-wire (NPN) | | 5 V, 12 V | | — | F7BAV | — | — | ● | ● | ○ | — | ○ | | IC circuit |
| | | | | 4-wire (NPN) | | | | H7NF | — | F79F | ● | ● | ○ | — | ○ | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

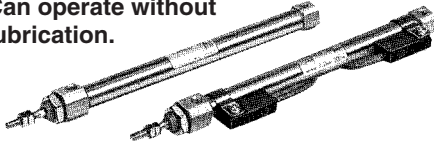
Series CJ2K

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy

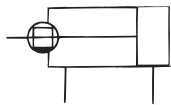
ø10: $\pm 1.5^\circ$, ø16: $\pm 1^\circ$

Can operate without lubrication.



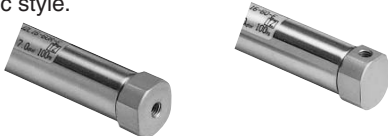
JIS Symbol

Double acting,
Single rod



Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.



Axial

Perpendicular



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC3 | Special port location |
| -XC51 | With hose nipple |

Specifications

| | | |
|-------------------------------|---|-----------------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Rod non-rotating accuracy | ø10 | $\pm 1.5^\circ$ |
| | ø16 | $\pm 1^\circ$ |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting Style and Accessory/For details, refer to page 6-3-11.

| Mounting style | | Basic style | Axial foot style | Rod side flange style | Double clevis style * |
|--------------------|------------------------|-------------|------------------|-----------------------|-----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Part numbers for auto switch mounting bracket are common with Series CJ2, double acting, single rod type. Refer to page 6-3-4.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|-----------|
| | 10 | 16 |
| Foot bracket | CJ-L016B | CJK-L016B |
| Flange bracket | CJ-F016B | CJK-F016B |
| T-bracket * | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod **Series CJ2K**

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

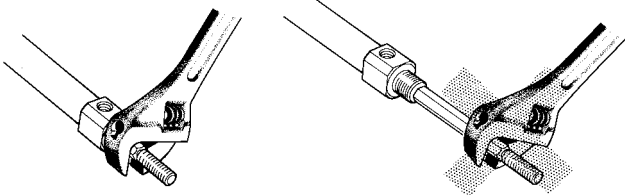
Caution on Handling

⚠ Caution

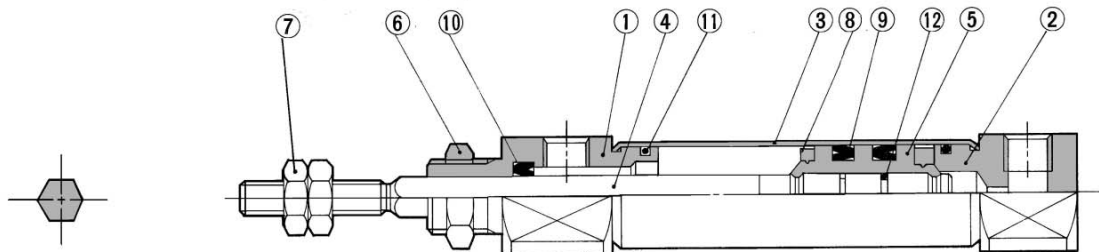
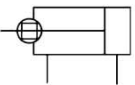
- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining nut or to the rod cover body. If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Tighten the retaining screws to an appropriate tightening torque within the range given below.
 $\phi 10$: 10.8 to 11.8 N·m, $\phi 16$: 20 to 21 N·m
- In the case of a non-rotating cylinder, do not operate it in such a way that rotational torque would be applied to the piston rod. If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.

| Allowable rotational torque (N·m) | $\phi 10$ | $\phi 16$ |
|-----------------------------------|-----------|-----------|
| | 0.02 | 0.04 |

- To screw a bracket onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. To tighten, take precautions to prevent the tightening torque from being applied to the non-rotating guide.
- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring). In particular, use a pair of ultra-mini pliers such as the Super Tool CSM-07A for removing and installing the snap ring on the $\phi 10$ cylinder.
- In the case of auto switch rail mounting style, do not remove the rail that is mounted. Because retaining screws extend into the cylinder, this could lead to an air leak.



Construction (Not able to disassemble.)



Rod section

Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Mounting nut | Brass | Nickel plated |

Weight

(g)

| Bore size (mm) | | 10 | 16 |
|--|----------------------------------|----|-----|
| Basic weight * | | 24 | 55 |
| Additional weight per each 15 mm of stroke | | 4 | 6.5 |
| Mounting bracket weight | Axial foot style | 20 | 20 |
| | Rod side flange style | 15 | 15 |
| | Double clevis style (With pin) * | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2KL10-45

- Basic weight 24 ($\phi 10$)
 - Additional weight 4/15 stroke
 - Cylinder stroke 45 stroke
 - Mounting bracket weight 20 (Axial foot style)
- $24 + 4/15 \times 45 + 20 = 56 \text{ g}$

Copper-free (For CRT manufacturing process)

| 20-CJ2K | Mounting style | Bore size | Stroke | Action | Port location on head cover |
|---------|----------------|-----------|--------|--------|-----------------------------|
|---------|----------------|-----------|--------|--------|-----------------------------|

• Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

| | | |
|----------------------------|---|-----------------|
| Action | Double acting, Single rod | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Cushion | Rubber bumper (Standard equipment) | |
| Rod non-rotating accuracy | $\phi 10$ | $\pm 1.5^\circ$ |
| | $\phi 16$ | $\pm 1^\circ$ |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-34.) | |
| Auto switch | Mountable (Band mounting style) | |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style | |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

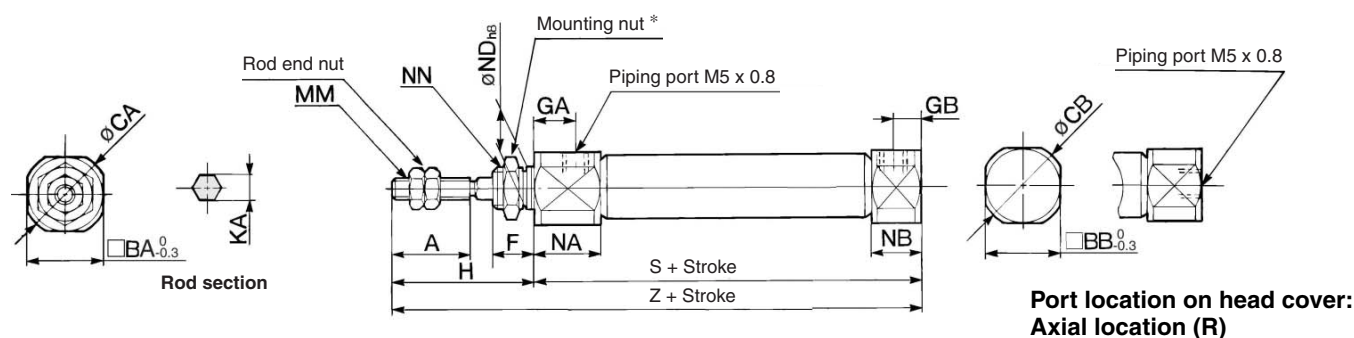
20-

Data

Series CJ2K

Basic Style (B)

CJ2KB Bore size Stroke Port location on head cover

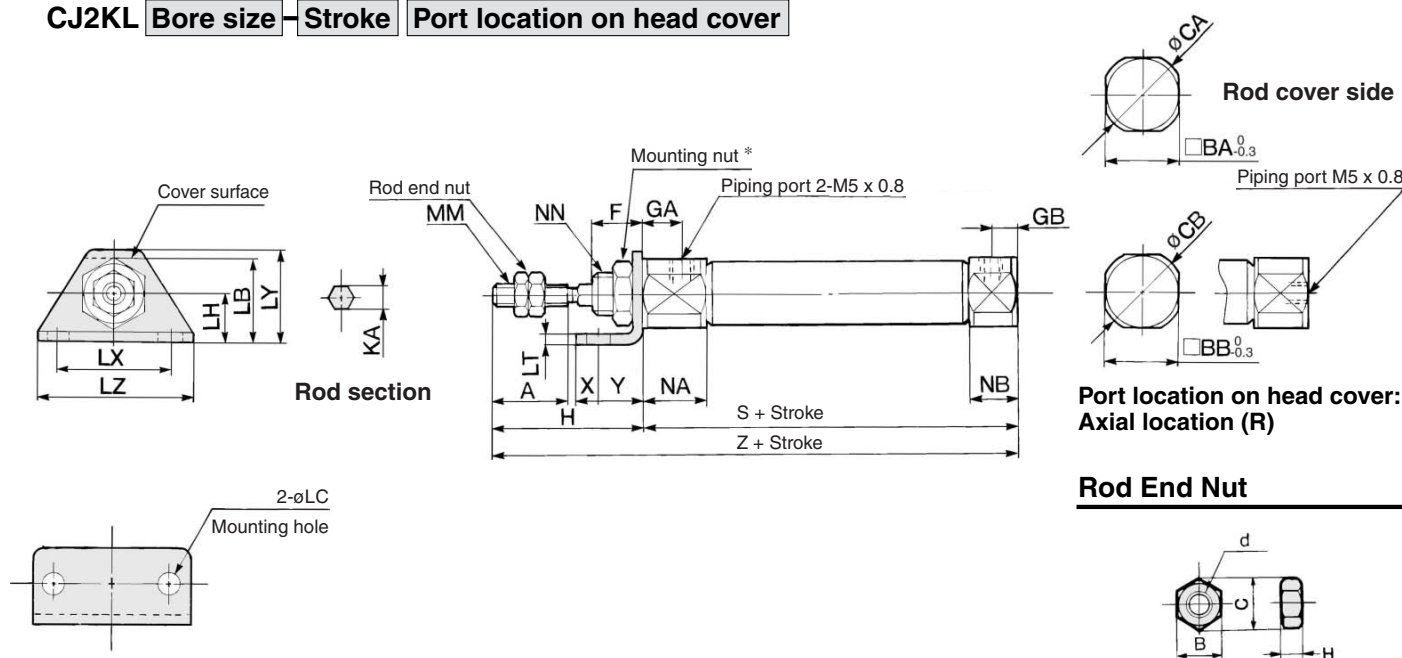


* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

| Bore size (mm) | A | BA | BB | CA | CB | F | GA | GB | H | KA | MM | NA | NB | NDh8 | NN | S | Z |
|----------------|----|------|------|----|----|---|----|----|----|-----|----------|------|-----|-----------------------------------|-----------|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 8 | 5 | 28 | 4.2 | M4 x 0.7 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1.0 | 46 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 8 | 5 | 28 | 5.2 | M5 x 0.8 | 12.5 | 9.5 | 12 ⁰ _{-0.027} | M12 x 1.0 | 47 | 75 |

Axial Foot Style (L)

CJ2KL Bore size Stroke Port location on head cover



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

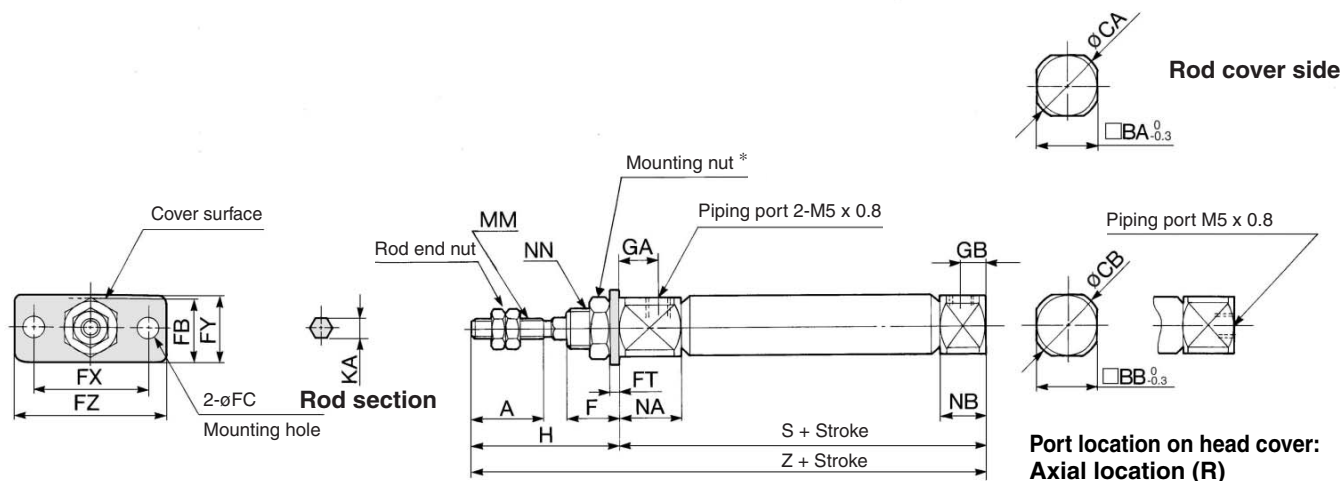
* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

| Bore size (mm) | A | BA | BB | CA | CB | F | GA | GB | H | KA | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y | S | Z |
|----------------|----|------|------|----|----|---|----|----|----|-----|------|-----|----|-----|----|----|----|----------|------|-----|-----------|---|---|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 8 | 5 | 28 | 4.2 | 21.5 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M4 x 0.7 | 12.5 | 9.5 | M10 x 1.0 | 6 | 9 | 46 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 8 | 5 | 28 | 5.2 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 9.5 | M12 x 1.0 | 6 | 9 | 47 | 75 |

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod **Series CJ2K**

Rod Side Flange Style (F)

CJ2KF Bore size Stroke Port location on head cover

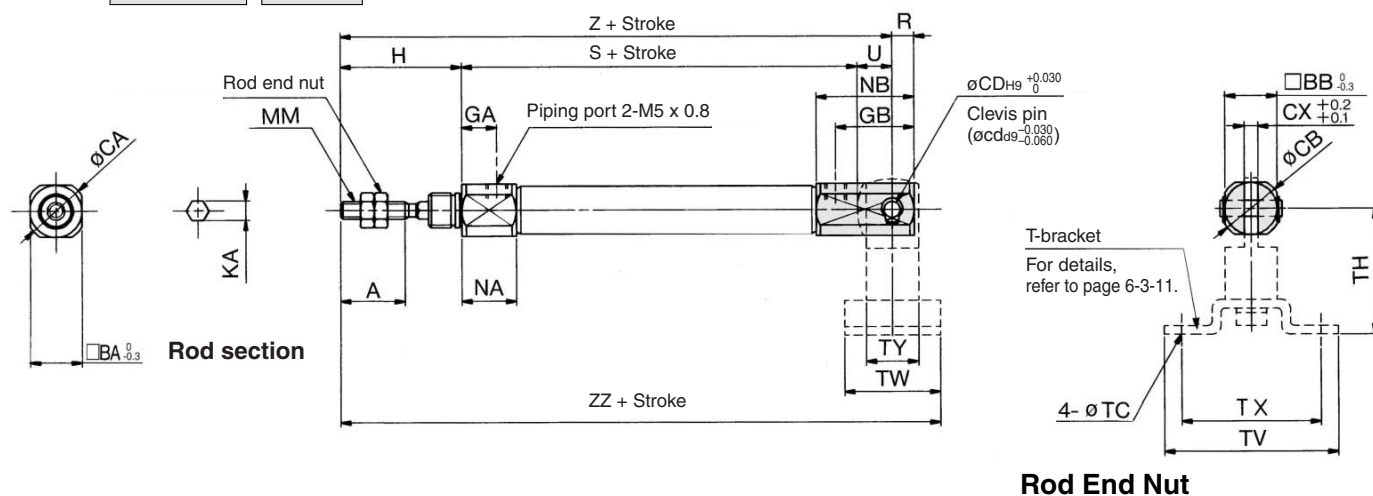


* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for ø10, SNKJ-016B for ø16)

| Bore size (mm) | A | BA | BB | CA | CB | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | KA | MM | NA | NB | NN | S | Z |
|----------------|----|------|------|----|----|---|------|-----|-----|----|----|----|----|----|----|-----|----------|------|-----|-----------|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 17.5 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 5 | 28 | 4.2 | M4 x 0.7 | 12.5 | 9.5 | M10 x 1.0 | 46 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 5 | 28 | 5.2 | M5 x 0.8 | 12.5 | 9.5 | M12 x 1.0 | 47 | 75 |

Double Clevis Style (D)

CJ2KD Bore size Stroke



* Clevis pin and set ring are shipped together.

Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

| Bore size (mm) | A | BA | BB | CA | CB | CD (cd) | CX | GA | GB | H | KA | MM | NA | NB | R | S | U | Z | ZZ |
|----------------|----|------|------|----|----|---------|-----|----|----|----|-----|----------|------|------|---|----|----|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 3.3 | 3.2 | 8 | 18 | 28 | 4.2 | M4 x 0.7 | 12.5 | 22.5 | 5 | 46 | 8 | 82 | 93 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 6.5 | 8 | 23 | 28 | 5.2 | M5 x 0.8 | 12.5 | 27.5 | 8 | 47 | 10 | 85 | 99 |

T-bracket Dimensions

| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |

CJ1
CJP
CJ2
CM2
CG1
MB
MB1
CA2
CS1
C76
C85
C95
CP95
NCM
NCA
D-
-X
20-
Data


Air Cylinder: Non-rotating Rod Type

Single Acting, Single Rod, Spring Return/Extend


Series CJ2K

ø10, ø16

How to Order



Spring extend



Spring return

Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Standard stroke (mm)

| | |
|-----|-----------------------------------|
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting style

| | |
|---|-----------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style |

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|----------------|
| Example | Rail mounting style | CDJ2KB16-60S-A |
| | Band mounting style | CDJ2KB10-45S-B |


* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

CJ2K **L** **16** **45** **S**

With auto switch

CDJ2K **L** **16** **45** **S** **J79W**



Built-in magnet

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-34.
* Single acting, Spring return (S), Clevis style is available only for 90° to the axis.
* Not applicable to single acting, spring extend (T).

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).
* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator/light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | |
|---|--------------------|---|-----------------|-------------------------|--------------|------|------------------------------|--------------------------|-------|------------------------|-------|-------|----------|--------------------|-----------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | Relay, PLC |
| | | Connector | | 2-wire | | 24 V | — | 200 V | — | A72 | A72H | ● | ● | — | | |
| | Grommet | 12 V | | | 100 V | | C73 | A73 | A73H | ● | ● | ● | — | — | | |
| | | With diagnostic output (2-color indication) | | | — | — | — | A79W | — | ● | ● | — | — | — | | |
| | Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | |
| 3-wire (PNP) | | | 12 V | | H7A2 | | F7PV | | F7P | ● | ● | ○ | — | ○ | — | |
| Connector | | | | | 2-wire | | H7B | | F7BV | J79 | ● | ● | ○ | — | | ○ |
| Diagnostic indication (2-color indication) | | Grommet | 3-wire (NPN) | | 5 V, 12 V | | H7NW | | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit |
| | | | 3-wire (PNP) | | | | H7PW | | — | F7PW | ● | ● | ○ | — | ○ | — |
| Water resistant (2-color indication) | | Grommet | 2-wire | | 12 V | | H7BW | | F7BWV | J79W | ● | ● | ○ | — | ○ | |
| | | | — | | F7BAV | | — | | — | ● | ● | ○ | — | — | | |
| With diagnostic output (2-color indication) | | Grommet | 4-wire (NPN) | | 5 V, 12 V | | H7NF | | — | F79F | ● | ● | ○ | — | ○ | IC circuit |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

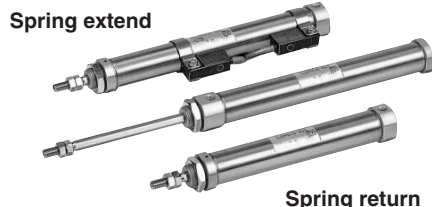
* Solid state switches marked with "○" are produced upon receipt of order.
** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2K**

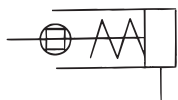
A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy
 $\phi 10: \pm 1.5^\circ$, $\phi 16: \pm 1^\circ$
Can operate without lubrication.

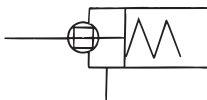


JIS Symbol

Single acting,
Spring return



Single acting,
Spring extend



Made to Order Specifications
 (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

**Be sure to read before handling.
 Refer to pages 6-20-3 to 6-20-6 for
 Safety Instructions and Actuator
 Precautions.**

Specifications

| | | |
|-------------------------------|---|------------------------------|
| Action | Single acting, Spring return | Single acting, Spring extend |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.15 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper (Standard equipment) | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Rod non-rotating accuracy | $\phi 10$ | $\pm 1.5^\circ$ |
| | $\phi 16$ | $\pm 1^\circ$ |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | $\phi 10$ | 0.035 J |
| | $\phi 16$ | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|-----------------------------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Spring Force

| Bore size (mm) | (N) | |
|----------------|----------------|---------------|
| | Retracted side | Extended side |
| 10 | 6.86 | 3.53 |
| 16 | 14.2 | 6.86 |

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting Style and Accessory/For details, refer to page 6-3-4.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double clevis* |
|--------------------|------------------------|-------------|------------------|-----------------------|----------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Part numbers for auto switch mounting bracket are common with Series CJ2, double acting, single rod type. Refer to page 6-3-4.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|-----------|
| | 10 | 16 |
| Foot bracket | CJ-L016B | CJK-L016B |
| Flange bracket | CJ-F016B | CJK-F016B |
| T-bracket * | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2K

Weight/Spring Return, (): Spring Extend (g)

| Bore size (mm) | | 10 | 16 |
|-------------------------|----------------------------------|--------|----------|
| Basic weight * | 15 stroke | 28(28) | 63(64) |
| | 30 stroke | 35(34) | 80(80) |
| | 45 stroke | 44(43) | 102(100) |
| | 60 stroke | 53(51) | 124(121) |
| | 75 stroke | — | 145(140) |
| | 100 stroke | — | 188(178) |
| | 125 stroke | — | 224(212) |
| | 150 stroke | — | 250(236) |
| Mounting bracket weight | Axial foot style | 20 | 20 |
| | Rod side flange style | 15 | 15 |
| | Double clevis style * (With pin) | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2L10-45T

- Basic weight 44 (ø10-45 stroke)
- Mounting bracket weight ... 20 (Axial foot style)

$$44 + 20 = 64 \text{ g}$$

Copper-free (For CRT manufacturing process)

20-CJ2K Mounting style Bore size Stroke Port location on head cover

Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube.

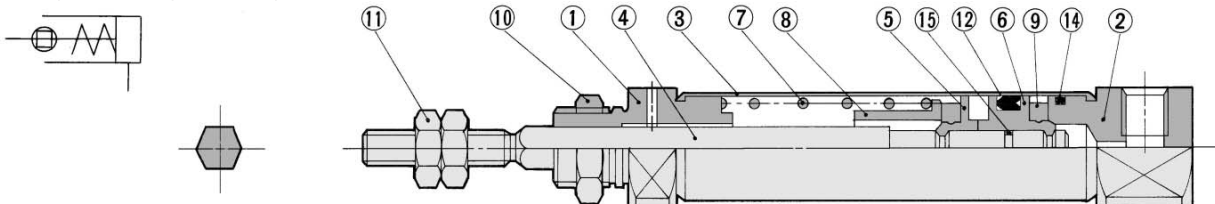
Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

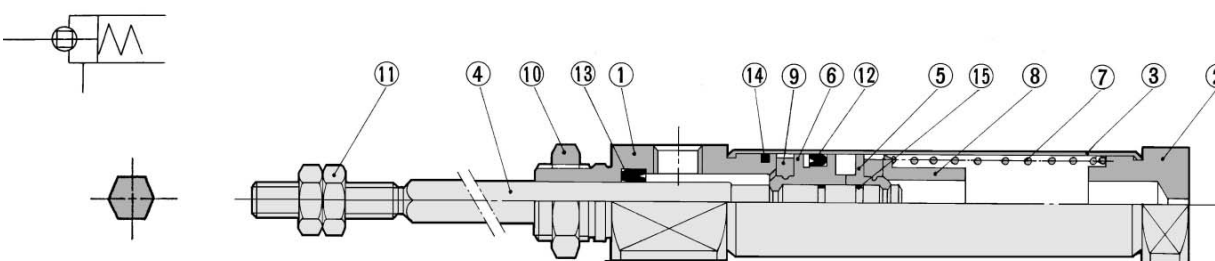
| | |
|----------------------------|---|
| Action | Single acting/Spring return, Spring extend |
| Fluid | Air |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.15 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Rod non-rotating accuracy | ø10: ±1.5°, ø16: ±1° |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-39.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style |

Construction (Not able to disassemble.)

Single acting, Spring return



Single acting, Spring extend



Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|----------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston A | Brass | |
| ⑥ | Piston B | Brass | |
| ⑦ | Return spring | Piano wire | Zinc chromated |
| ⑧ | Spring seat | Brass | |

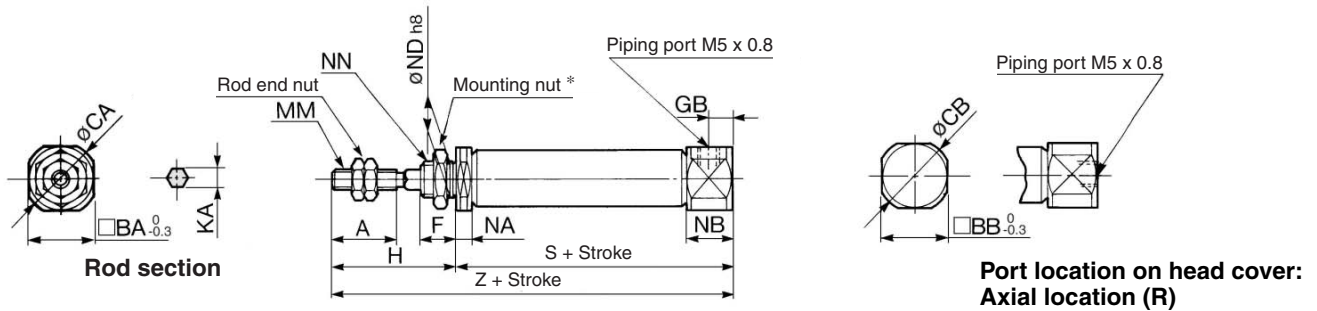
| No. | Description | Material | Note |
|-----|---------------|--------------|---------------|
| ⑨ | Bumper | Urethane | |
| ⑩ | Mounting nut | Brass | Nickel plated |
| ⑪ | Rod end nut | Rolled steel | Nickel plated |
| ⑫ | Piston seal | NBR | |
| ⑬ | Rod seal | NBR | |
| ⑭ | Tube gasket | NBR | |
| ⑮ | Piston gasket | NBR | |

Air Cylinder: Non-rotating Rod Type

Single Acting, Single Rod, Spring Return/Extend **Series CJ2K**

Single Acting, Spring Return: Basic Style (B)

CJ2KB Bore size Stroke S Port location on head cover



* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

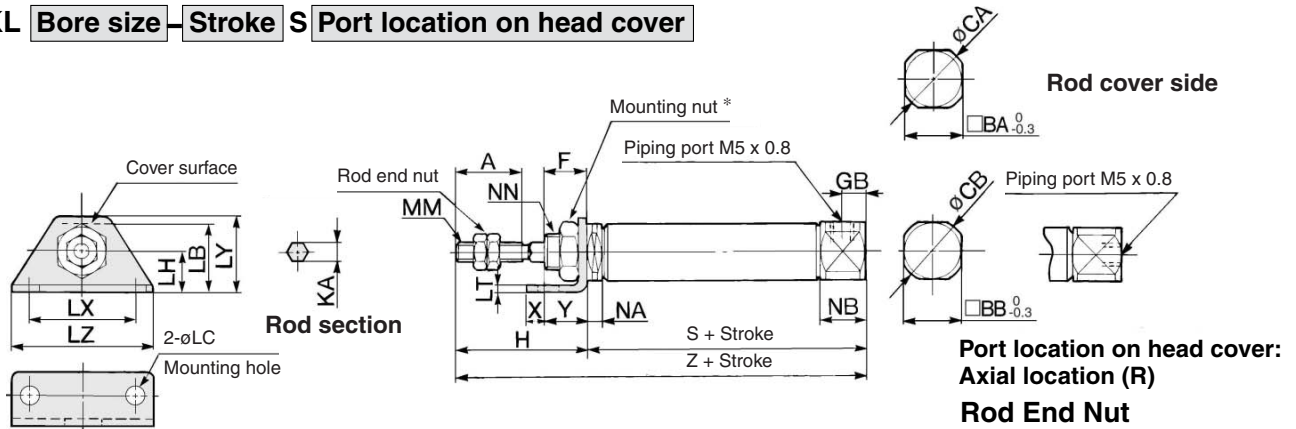
| Bore size (mm) | A | BA | BB | CA | CB | F | GB | H | KA | MM | NA | NB | NDh8 | NN |
|----------------|----|------|------|----|----|---|----|----|-----|----------|-----|-----|-----------------------------------|-----------|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 5 | 28 | 4.2 | M4 x 0.7 | 5.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1.0 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 5 | 28 | 5.2 | M5 x 0.8 | 5.5 | 9.5 | 12 ⁰ _{-0.027} | M12 x 1.0 |

Dimensions by Stroke

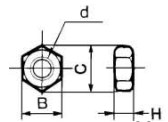
| Bore size (mm) | S | | | | | | | | Z | | | | | | | |
|----------------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

Single Acting, Spring Return: Axial Foot Style (L)

CJ2KL Bore size Stroke S Port location on head cover



Port location on head cover:
Axial location (R)
Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

| Bore size (mm) | A | BA | BB | CA | CB | F | GB | H | KA | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y |
|----------------|----|------|------|----|----|---|----|----|-----|------|-----|----|-----|----|----|----|----------|-----|-----|-----------|---|---|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 5 | 28 | 4.2 | 21.5 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M4 x 0.7 | 5.5 | 9.5 | M10 x 1.0 | 6 | 9 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 5 | 28 | 5.2 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 5.5 | 9.5 | M12 x 1.0 | 6 | 9 |

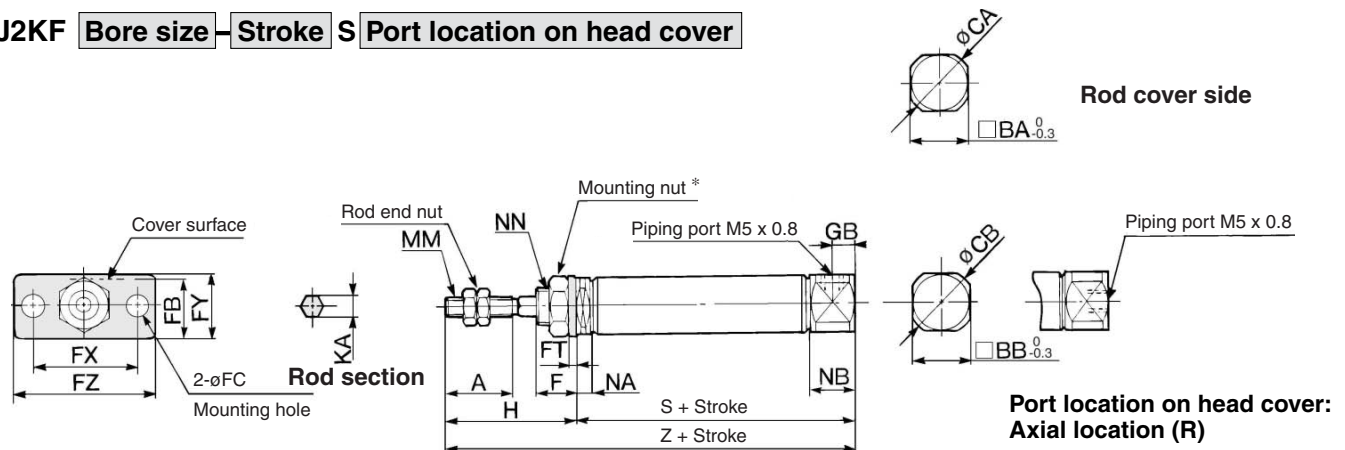
Dimensions by Stroke

| Bore size (mm) | S | | | | | | | | Z | | | | | | | |
|----------------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

Series CJ2K

Single Acting, Spring Return: Rod Side Flange Style (F)

CJ2KF Bore size Stroke S Port location on head cover



* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

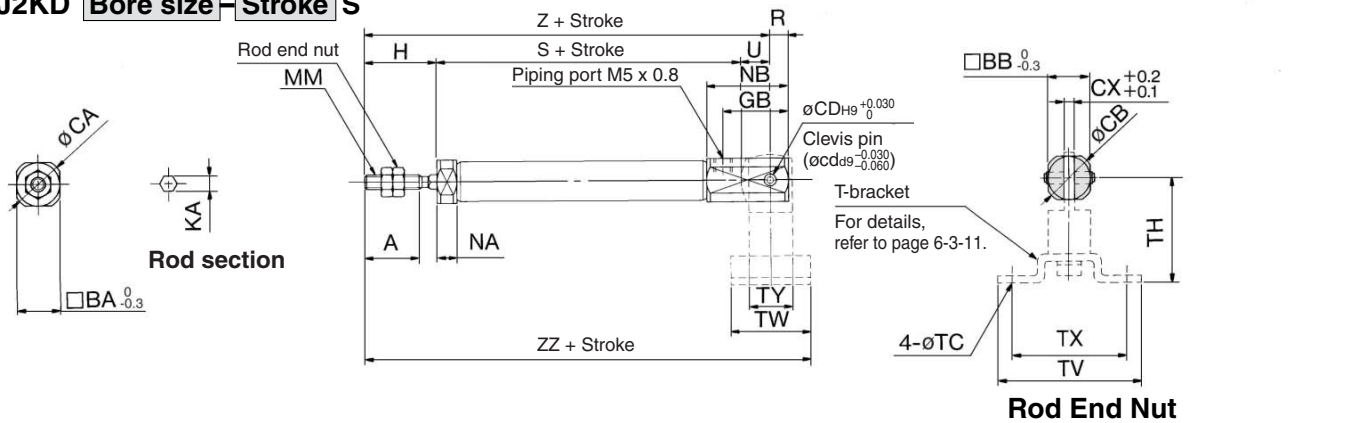
| Bore size (mm) | A | BA | BB | CA | CB | F | FB | FC | FT | FX | FY | FZ | GB | H | KA | MM | NA | NB | NN |
|----------------|----|------|------|----|----|---|------|-----|-----|----|----|----|----|----|-----|----------|-----|-----|-----------|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 17.5 | 5.5 | 2.3 | 33 | 20 | 42 | 5 | 28 | 4.2 | M4 x 0.7 | 5.5 | 9.5 | M10 x 1.0 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 5 | 28 | 5.2 | M5 x 0.8 | 5.5 | 9.5 | M12 x 1.0 |

Dimensions by Stroke

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

Single Acting, Spring Return: Double Clevis Style (D)

CJ2KD Bore size Stroke S



* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | BA | BB | CA | CB | CD(cd) | CX | GB | H | KA | MM | NA | NB | R | U |
|----------------|----|------|------|----|----|--------|-----|----|----|-----|----------|-----|------|---|----|
| 10 | 15 | 12 | 12 | 14 | 14 | 3.3 | 3.2 | 18 | 20 | 4.2 | M4 x 0.7 | 5.5 | 22.5 | 5 | 8 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 6.5 | 23 | 20 | 5.2 | M5 x 0.8 | 5.5 | 27.5 | 8 | 10 |

Dimensions by Stroke

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | | ZZ | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | | 45.5 | 53 | 65 | 77 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — | 84.5 | 92 | 104 | 116 | — | — | — | — |
| 16 | | 45.5 | 54 | 66 | 78 | 84 | 108 | 126 | 138 | 75.5 | 84 | 96 | 108 | 114 | 138 | 156 | 168 | 89.5 | 98 | 110 | 122 | 128 | 152 | 170 | 182 |

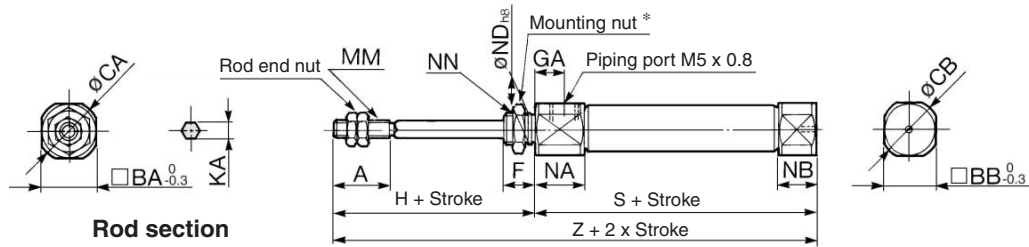
T-bracket Dimensions

| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |

Air Cylinder: Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2K**

Single Acting, Spring Extend: Basic Style (B)

CJ2KB Bore size — Stroke T



* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

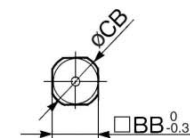
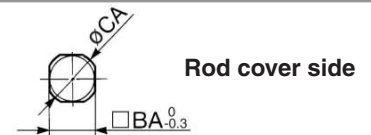
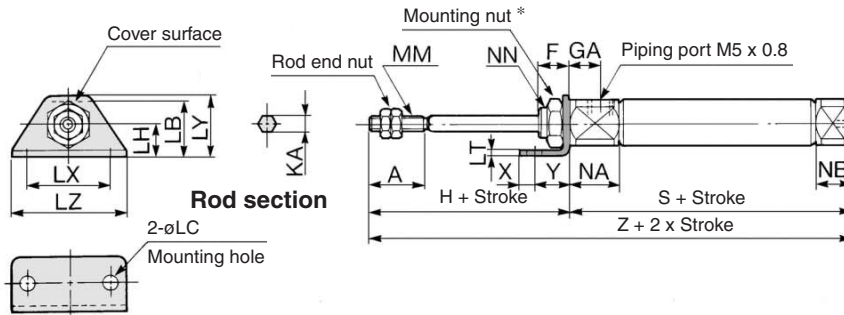
| Bore size (mm) | A | BA | BB | CA | CB | F | GA | H | KA | MM | NA | NB | NDh8 | NN |
|----------------|----|------|------|----|----|---|----|----|-----|----------|------|-----|----------------------|-----------|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 8 | 28 | 4.2 | M4 x 0.7 | 12.5 | 5.5 | 10 _{-0.022} | M10 x 1.0 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 8 | 28 | 5.2 | M5 x 0.8 | 12.5 | 5.5 | 12 _{-0.027} | M12 x 1.0 |

Dimensions by Stroke

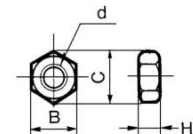
| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | Stroke | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | Stroke | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

Single Acting, Spring Extend: Axial Foot Style (T)

CJ2KL Bore size — Stroke T



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

| Bore size (mm) | A | BA | BB | CA | CB | F | GA | H | KA | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | X | Y |
|----------------|----|------|------|----|----|---|----|----|-----|------|-----|----|-----|----|----|----|----------|------|-----|-----------|---|---|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 8 | 28 | 4.2 | 21.5 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M4 x 0.7 | 12.5 | 5.5 | M10 x 1.0 | 6 | 9 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 8 | 28 | 5.2 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 12.5 | 5.5 | M12 x 1.0 | 6 | 9 |

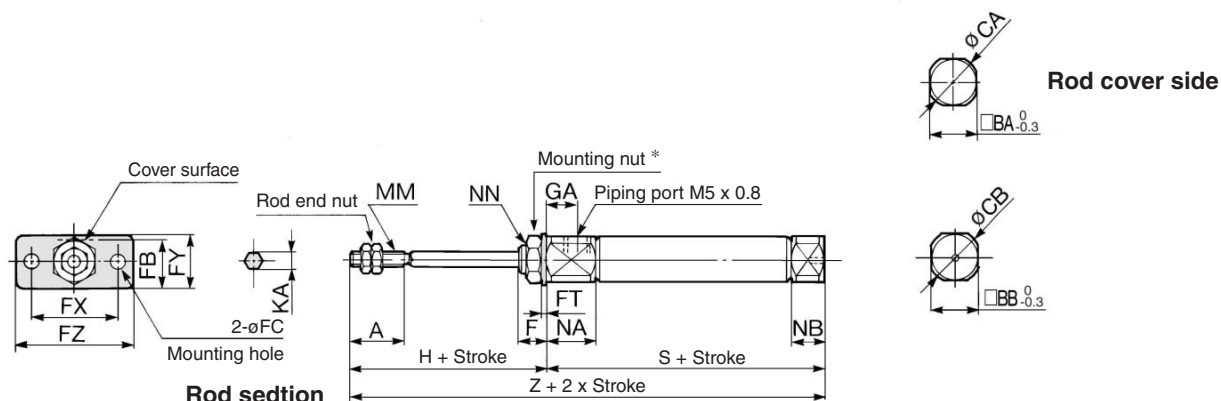
Dimensions by Stroke

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | Stroke | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | Stroke | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

Series CJ2K

Single Acting, Spring Extend: Rod Side Flange Style (F)

CJ2KF Bore size Stroke T



* Refer to page 6-3-11 for details of the mounting nut. (SNJ-016B for $\phi 10$, SNKJ-016B for $\phi 16$)

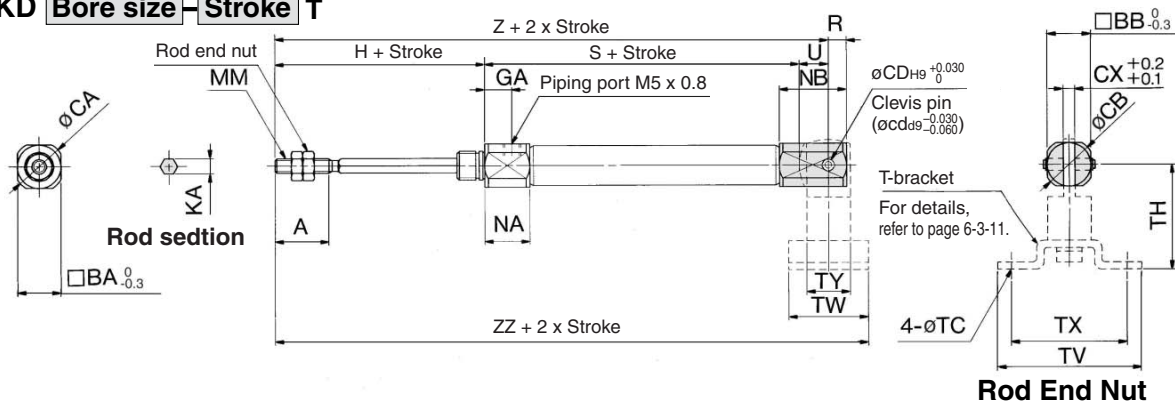
| Bore size (mm) | A | BA | BB | CA | CB | F | FB | FC | FT | FX | FY | FZ | GA | H | KA | MM | NA | NB | NN |
|----------------|----|------|------|----|----|---|------|-----|-----|----|----|----|----|----|-----|----------|------|-----|-----------|
| 10 | 15 | 15 | 12 | 17 | 14 | 8 | 17.5 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 28 | 4.2 | M4 x 0.7 | 12.5 | 5.5 | M10 x 1.0 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 8 | 28 | 5.2 | M5 x 0.8 | 12.5 | 5.5 | M12 x 1.0 |

Dimensions by Stroke

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | Stroke | 48.5 | 56 | 68 | 80 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | Stroke | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

Single Acting, Spring Extend/Double Clevis Style (D)

CJ2KD Bore size Stroke T



* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | BA | BB | CA | CB | CD (cd) | CX | GA | H | KA | MM | NA | NB | R | U |
|----------------|----|------|------|----|----|---------|-----|----|----|-----|----------|------|------|---|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 3.3 | 3.2 | 8 | 28 | 4.2 | M4 x 0.7 | 12.5 | 18.5 | 5 | 8 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 6.5 | 8 | 28 | 5.2 | M5 x 0.8 | 12.5 | 23.5 | 8 | 10 |

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

Dimensions by Stroke

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | | ZZ | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | Stroke | 48.5 | 56 | 68 | 80 | — | — | — | — | 84.5 | 92 | 104 | 116 | — | — | — | — | 95.5 | 103 | 115 | 127 | — | — | — | — |
| 16 | Stroke | 48.5 | 57 | 69 | 81 | 87 | 111 | 129 | 141 | 86.5 | 95 | 107 | 119 | 125 | 149 | 167 | 179 | 100.5 | 109 | 121 | 133 | 139 | 163 | 181 | 193 |

T-bracket Dimensions

| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |


Air Cylinder: Built-in Speed Controller Type Double Acting, Single Rod

Series CJ2Z

ø10, ø16



How to Order



Without auto switch

CJ2Z

Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |


Standard stroke (mm)

| | |
|-----|---|
| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting style

| | |
|---|-----------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style |



With auto switch

CDJ2Z

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting style) or "B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2ZB16-60-A |
| | Band mounting style | CDJ2ZB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

*For configuration, refer to page 6-3-46.
* Double clevis style is only available for being perpendicular to axis.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|---|---------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) Perpendicular | In-line | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — | |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | Relay, PLC | | | |
| | Connector | | | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | | | — | | |
| | | | | | Grommet | — | — | — | C73C | A73C | — | ● | ● | | | | ● | — |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | |
| | Connector | 2-wire | | 12 V | | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | — | | |
| | | | | H7C | | | | J79C | — | ● | ● | ● | ● | — | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | | | 5 V, 12 V | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | | IC circuit |
| | | | | 3-wire (PNP) | | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | — |
| | Water resistant (2-color indication) | Grommet | | 2-wire | | | | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | — |
| | | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | |
| | With diagnostic output (2-color indication) | Grommet | | 4-wire (NPN) | | | | 5 V, 12 V | H7NF | — | F79F | ● | ● | ○ | — | ○ | | IC circuit |
| | | | | | | | | | — | F7BAV | — | — | ● | ○ | — | — | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

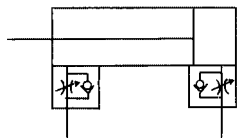
Series CJ2Z

Space-saving air cylinder with speed controller built-in cylinder cover



JIS Symbol

Double acting,
Single rod



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper (Standard equipment) | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Speed controller | Built-in | |
| Mounting | Basic style, Axial foot style Rod side flange style, Double clevis style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting Style and Accessory/For details, refer to page 6-3-11.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double clevis* style |
|--------------------|------------------------|-------------|------------------|-----------------------|----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.



Axial



Perpendicular

Part numbers for mounting bracket and auto switch mounting bracket are common with Series CJ2, double acting, single rod type. Refer to page 6-3-4.

Air Cylinder: Built-in Speed Controller Type Double Acting, Single Rod **Series CJ2Z**

Weight

(g)

| Bore size (mm) | | 10 | 16 |
|--|----------------------------------|----|-----|
| Basic weight * | | 40 | 73 |
| Additional weight per each 15 mm of stroke | | 4 | 6.5 |
| Mounting bracket weight | Axial foot style | 8 | 20 |
| | Rod side flange style | 5 | 15 |
| | Double clevis style * (With pin) | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.
Calculation: (Example) CJ2ZL10-45

- Basic weight 40 (ø10)
 - Additional weight 4/15 stroke
 - Cylinder stroke 45 stroke
 - Mounting bracket weight 8 (Axial foot style)
- 40 + 4/15 x 45 + 8 = 60 g

Copper-free (For CRT manufacturing process)

20-CJ2Z **Mounting style** **Bore size** **Stroke** **Port location on head cover**

• Copper-free

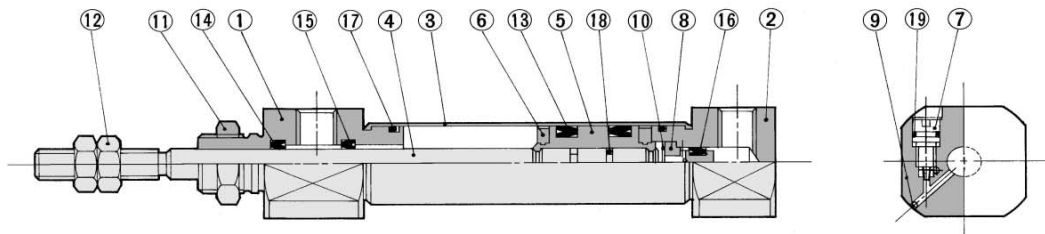
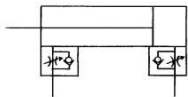
Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.



Specifications

| | |
|----------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.06 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-46.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style |

Construction (Not able to disassemble.)



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|-------------------|----------------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Bumper | Urethane | |
| ⑦ | Speed controller needle | Stainless steel | |
| ⑧ | Check packing sleeve | Brass | |
| ⑨ | Steel balls | Bearing steel | |
| ⑩ | Snap ring | Carbon tool steel | Black zinc chromated |

| No. | Description | Material | Note |
|-----|---------------|--------------|---------------|
| ⑪ | Mounting nut | Brass | Nickel plated |
| ⑫ | Rod end nut | Rolled steel | Nickel plated |
| ⑬ | Piston seal | NBR | |
| ⑭ | Rod seal | NBR | |
| ⑮ | Check seal A | NBR | |
| ⑯ | Check seal B | NBR | |
| ⑰ | Tube gasket | NBR | |
| ⑱ | Piston gasket | NBR | |
| ⑲ | Needle seal | NBR | |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

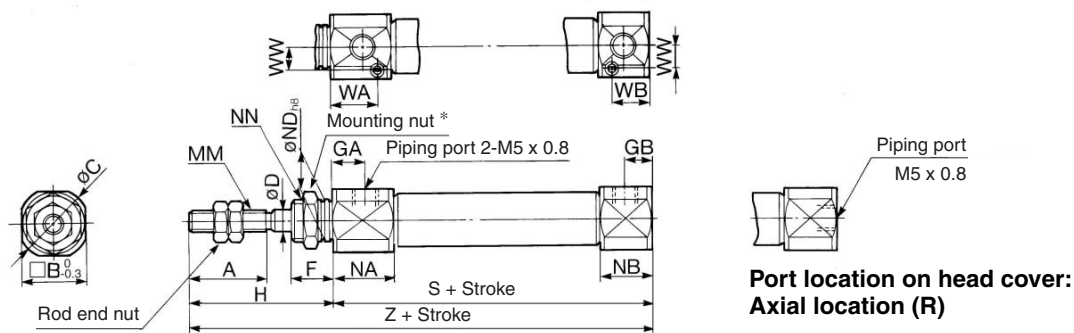
20-

Data

Series CJ2Z

Basic Style (B)

CJ2ZB Bore size Stroke Port location on head cover

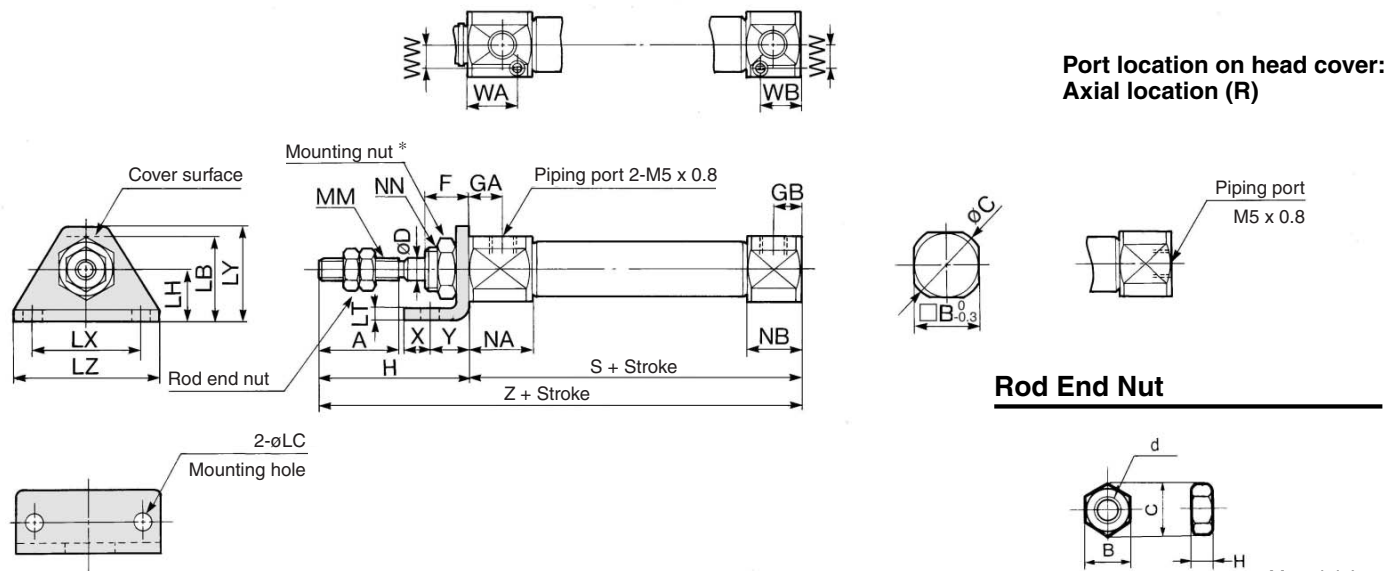


* For details of the mounting nut, refer to page 6-3-11.

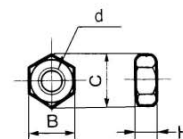
| Bore size (mm) | A | B | C | D | F | GA | GB | H | MM | NA | NB | NDh8 | NN | WA | WB | WW | S | Z |
|----------------|----|------|----|---|---|-----|-----|----|----------|----|----|-----------------------------------|-----------|------|------|-----|----|----|
| 10 | 15 | 15 | 17 | 4 | 8 | 7.5 | 6.5 | 28 | M4 x 0.7 | 21 | 18 | 8 ⁰ _{-0.022} | M8 x 1.0 | 14.5 | 13.5 | 4.5 | 63 | 91 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 7.5 | 6.5 | 28 | M5 x 0.8 | 21 | 18 | 10 ⁰ _{-0.022} | M10 x 1.0 | 14.5 | 13.5 | 5.5 | 64 | 92 |

Axial Foot Style (L)

CJ2ZL Bore size Stroke Port location on head cover



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

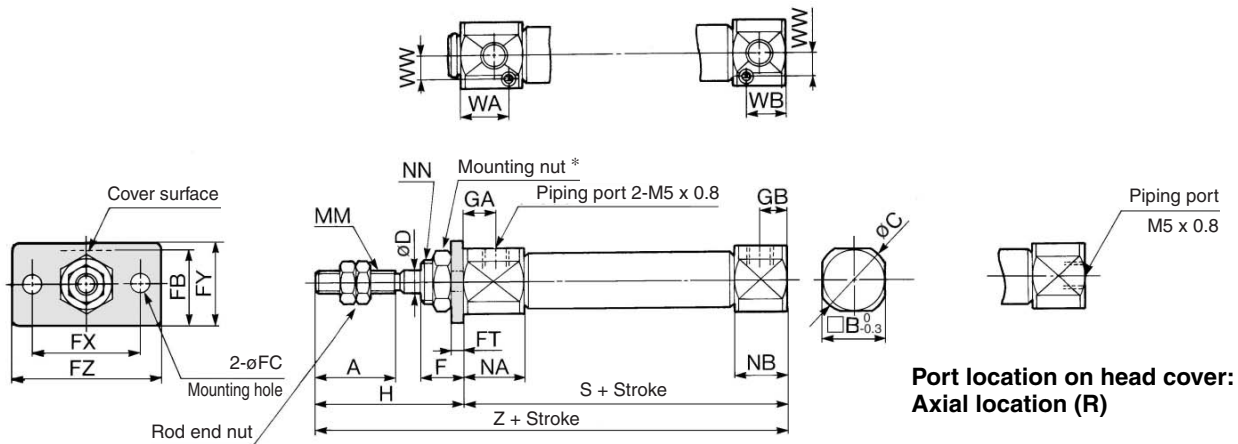
* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GA | GB | H | LB | LC | LH | LT | LX | LY | LZ | MM | NA | NB | NN | S | WA | WB | WW | X | Y | Z |
|----------------|----|------|----|---|---|-----|-----|----|------|-----|----|-----|----|------|----|----------|----|----|-----------|----|------|------|-----|---|---|----|
| 10 | 15 | 15 | 17 | 4 | 8 | 7.5 | 6.5 | 28 | 16.5 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | M4 x 0.7 | 21 | 18 | M8 x 1.0 | 63 | 14.5 | 13.5 | 4.5 | 5 | 7 | 91 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 7.5 | 6.5 | 28 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | M5 x 0.8 | 21 | 18 | M10 x 1.0 | 64 | 14.5 | 13.5 | 5.5 | 6 | 9 | 92 |

Air Cylinder: Built-in Speed Controller Type Double Acting, Single Rod **Series CJ2Z**

Rod Side Flange Style (F)

CJ2ZF Bore size Stroke Port location on head cover

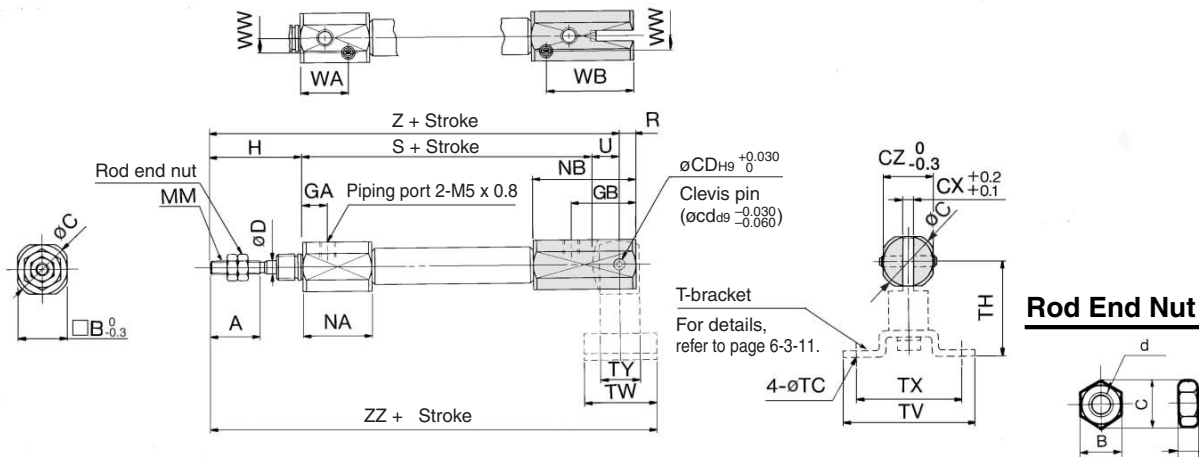


* For details of the mounting nut, refer to page 6-3-11.

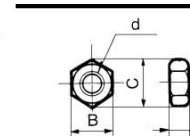
| Bore size (mm) | A | B | C | D | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | MM | NA | NB | NN | WA | WB | WW | S | Z |
|----------------|----|------|----|---|---|------|-----|-----|----|----|----|-----|-----|----|----------|----|----|-----------|------|------|-----|----|----|
| 10 | 15 | 15 | 17 | 4 | 8 | 14.5 | 4.5 | 1.6 | 24 | 14 | 32 | 7.5 | 6.5 | 28 | M4 x 0.7 | 21 | 18 | M8 x 1.0 | 14.5 | 13.5 | 4.5 | 63 | 91 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 7.5 | 6.5 | 28 | M5 x 0.8 | 21 | 18 | M10 x 1.0 | 14.5 | 13.5 | 5.5 | 64 | 92 |

Double Clevis Style (D)

CJ2ZD Bore size Stroke



Rod End Nut



| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* Clevis pin and set ring are shipped together.

| Bore size (mm) | A | B | C | CD (co) | CX | CZ | D | GA | GB | H | MM | NA | NB | R | S | U | WA | WB | WW | Z | ZZ |
|----------------|----|------|----|---------|-----|------|---|-----|------|----|----------|----|----|---|----|----|------|------|-----|-----|-----|
| 10 | 15 | 15 | 17 | 3.3 | 3.2 | 15 | 4 | 7.5 | 19.5 | 28 | M4 x 0.7 | 21 | 31 | 5 | 63 | 8 | 14.5 | 26.5 | 4.5 | 99 | 110 |
| 16 | 15 | 18.3 | 20 | 5 | 6.5 | 18.3 | 5 | 7.5 | 24.5 | 28 | M5 x 0.8 | 21 | 36 | 8 | 64 | 10 | 14.5 | 31.5 | 5.5 | 102 | 116 |

T-bracket Dimensions

| Bore size (mm) | TC | TH | TV | TW | TX | TY |
|----------------|-----|----|----|----|----|----|
| 10 | 4.5 | 29 | 40 | 22 | 32 | 12 |
| 16 | 5.5 | 35 | 48 | 28 | 38 | 16 |


Air Cylinder: Built-in Speed Controller Type Double Acting, Double Rod

Series CJ2ZW

ø10, ø16



How to Order



Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Mounting style

| | |
|---|--------------|
| B | Basic style |
| L | Foot style |
| F | Flange style |

Standard stroke (mm)

| | |
|-----|----------------|
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-15.

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|----------------|
| Example | Rail mounting style | CDJ2ZWB16-60-A |
| | Band mounting style | CDJ2ZWB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

CJ2ZW L 16 45

With auto switch


CDJ2ZW L 16 45 J79W

Built-in magnet

Auto switch

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |



* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|--------------------------|-------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|---|---|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | | |
| | | | | | | | Perpendicular | In-line | | | | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — | | | |
| | | — | | | | 200 V | — | A72 | A72H | ● | ● | — | — | | | | | | | |
| | Connector | 2-wire | | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | — | | | Relay, PLC | | |
| | | | | | — | — | C73C | A73C | — | ● | ● | ● | ● | — | | | | | | |
| | With diagnostic output (2-color indication) | Grommet | — | — | — | — | A79W ** | — | ● | ● | — | — | — | — | — | — | — | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | | |
| | | 3-wire (PNP) | | H7A2 | | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | | | |
| | | Connector | | 2-wire | | | | 12 V | H7B | F7BV | J79 | ● | ● | ○ | — | | | ○ | — | |
| | | | | | | | | H7C | J79C | — | ● | ● | ● | ● | — | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | | | |
| | | | | 3-wire (PNP) | | H7PW | | — | F7PW | ● | ● | ○ | — | ○ | | | | | | |
| | | | | 2-wire | | 12 V | | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | | — | | |
| | | | | | | H7BA | | — | F7BA | — | ● | ○ | — | ○ | | | | | | |
| | Water resistant (2-color indication) | Grommet | | 4-wire (NPN) | 5 V, 12 V | — | | F7BAV | — | — | ● | ○ | — | — | — | — | | — | — | — |
| | With diagnostic output (2-color indication) | | | | | H7NF | | — | F79F | ● | ● | ○ | — | ○ | IC circuit | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
** "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

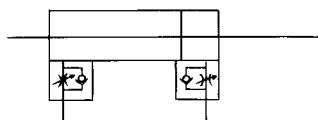
Air Cylinder: Built-in Speed Controller Type Double Acting, Double Rod **Series CJ2ZW**

Space-saving air cylinder with speed controller built-in cylinder cover



JIS Symbol

Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Double rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.1 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Speed controller | Built-in type | |
| Mounting | Basic style, Axial foot style, Flange style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|-----------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60 |

* Intermediate stroke length is available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-15.

Mounting Style and Accessory/For details, refer to page 6-3-11.

| Mounting | | Basic style | Foot style | Flange style |
|--------------------|------------------------|-------------|------------|--------------|
| Standard equipment | Mounting nut | ● | ● | ● |
| | Rod end nut | ● | ● | ● |
| Option | Single knuckle joint | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● |

* Knuckle pin and snap ring are shipped together with double knuckle joint.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|----------|
| | 10 | 16 |
| Foot bracket | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F010B | CJ-F016B |

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2ZW

Weight

(g)

| Bore size (mm) | | 10 | 16 |
|--|--------------|----|----|
| Basic weight * | | 50 | 85 |
| Additional weight per each 15 mm of stroke | | 6 | 9 |
| Mounting bracket weight | Foot style | 16 | 40 |
| | Flange style | 5 | 15 |

* Rod end nut are included in the basic weight.

Calculation: (Example) CJ2ZWL10-45

- Basic weight 50 (ø10)
 - Additional weight 6/15 stroke
 - Cylinder stroke 45 stroke
 - Mounting bracket weight 16 (Axial foot style)
- $50 + 6/15 \times 45 + 16 = 84 \text{ g}$

Copper-free (For CRT manufacturing process)

20-CJ2XW **Mounting style** **Bore size** **Stroke** **Port location on head cover**

• Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube.

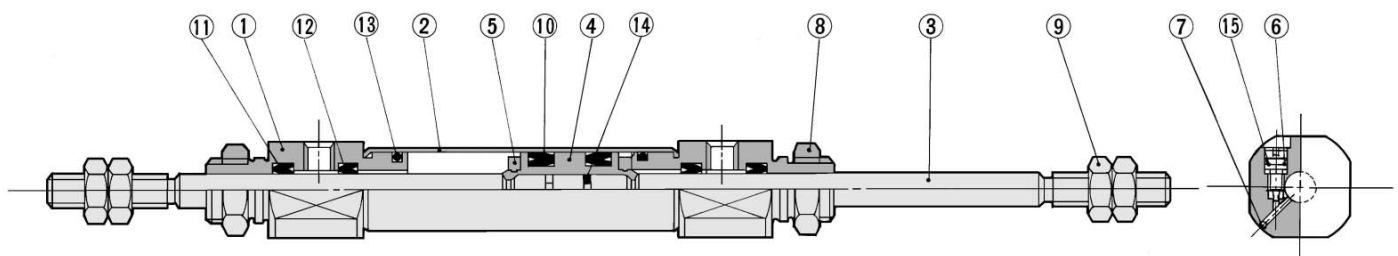
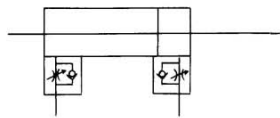
Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.



Specifications

| | |
|----------------------------|---------------------------------------|
| Action | Double acting, Double rod |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.1 MPa |
| Cushion | Rubber bumper |
| Standard stroke (mm) | 15, 30, 45, 60 |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Basic style, Foot style, Flange style |

Construction (Not able to disassemble.)



Component Parts

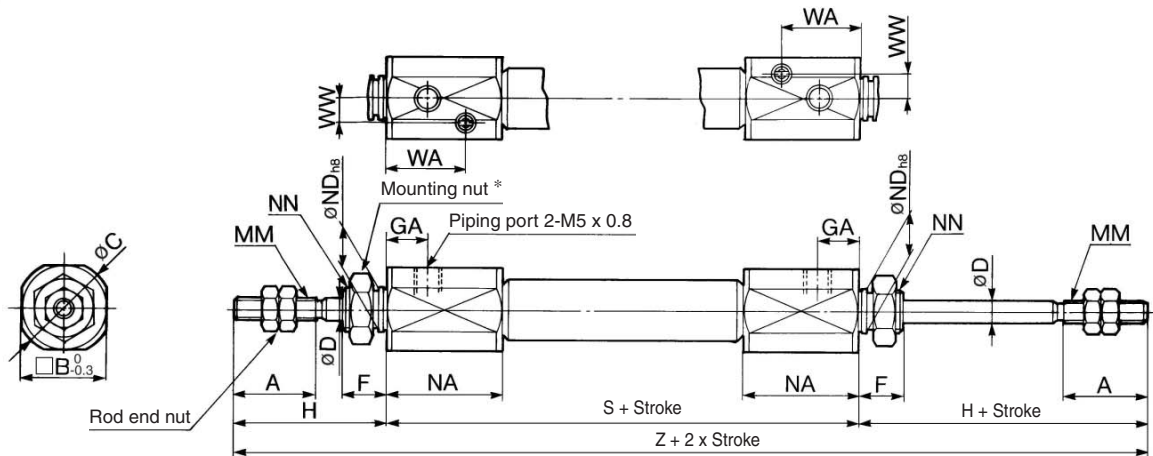
| No. | Description | Material | Note |
|-----|-------------------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Cylinder tube | Stainless steel | |
| ③ | Piston rod | Stainless steel | |
| ④ | Piston | Brass | |
| ⑤ | Bumper | Urethane | |
| ⑥ | Speed controller needle | Stainless steel | |
| ⑦ | Steel balls | Bearing steel | |
| ⑧ | Mounting nut | Brass | Nickel plated |

| No. | Description | Material | Note |
|-----|---------------|--------------|---------------|
| ⑨ | Rod end nut | Rolled steel | Nickel plated |
| ⑩ | Piston seal | NBR | |
| ⑪ | Rod seal | NBR | |
| ⑫ | Check seal | NBR | |
| ⑬ | Tube gasket | NBR | |
| ⑭ | Piston gasket | NBR | |
| ⑮ | Needle seal | NBR | |

Air Cylinder: Built-in Speed Controller Type Double Acting, Double Rod **Series CJ2ZW**

Basic Style (B)

CJ2ZWB Bore size Stroke

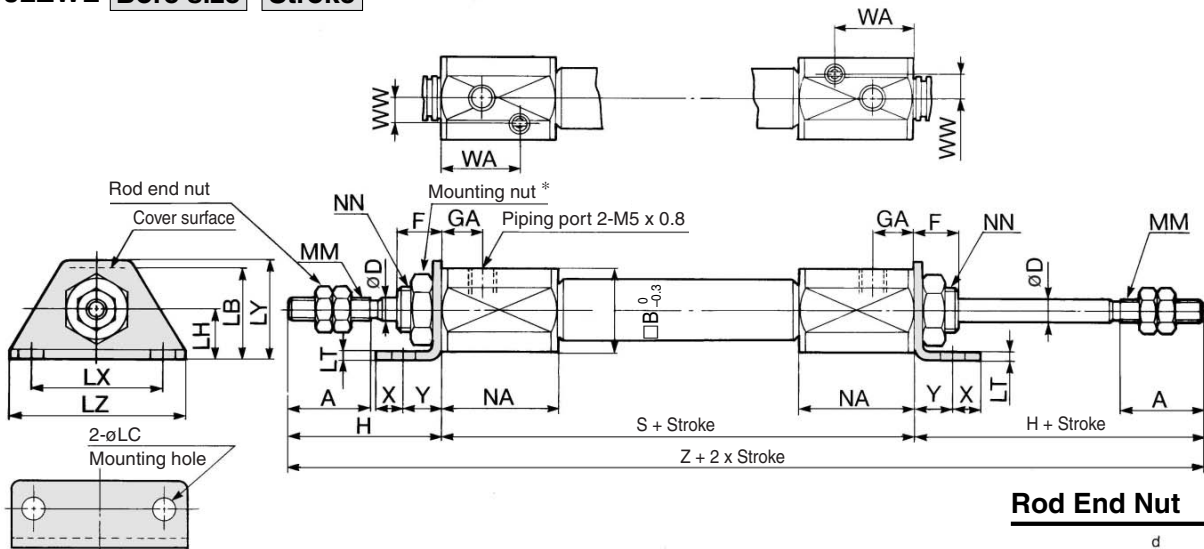


* For details of the mounting nut, refer to page 6-3-11.

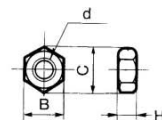
| Bore size (mm) | A | B | C | D | F | GA | H | MM | NA | NDh8 | NN | S | WA | WW | Z |
|----------------|----|------|----|---|---|-----|----|----------|----|-----------------------------------|-----------|----|------|-----|-----|
| 10 | 15 | 15 | 17 | 4 | 8 | 7.5 | 28 | M4 x 0.7 | 21 | 8 ⁰ _{-0.022} | M8 x 1.0 | 66 | 14.5 | 4.5 | 122 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 7.5 | 28 | M5 x 0.8 | 21 | 10 ⁰ _{-0.022} | M10 x 1.0 | 67 | 14.5 | 5.5 | 123 |

Foot Style (L)

CJ2ZWL Bore size Stroke



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

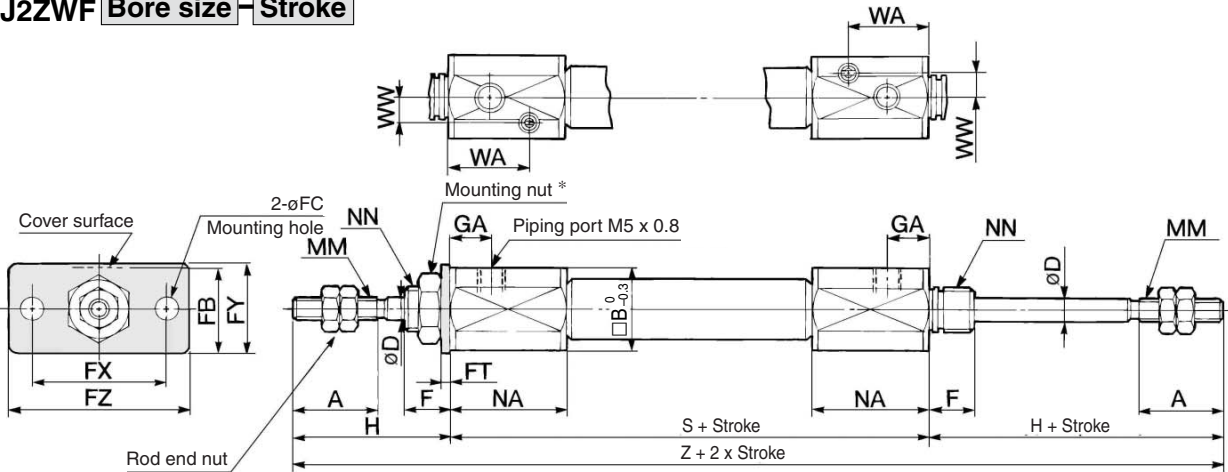
* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | D | F | LB | LC | LH | LT | LX | LY | LZ | GA | H | MM | NA | NN | S | WA | WW | X | Y | Z |
|----------------|----|------|---|---|------|-----|----|-----|----|------|----|-----|----|----------|----|-----------|----|------|-----|---|---|-----|
| 10 | 15 | 15 | 4 | 8 | 16.5 | 4.5 | 9 | 1.6 | 24 | 16.5 | 32 | 7.5 | 28 | M4 x 0.7 | 21 | M8 x 1.0 | 66 | 14.5 | 4.5 | 5 | 7 | 122 |
| 16 | 15 | 18.3 | 5 | 8 | 23 | 5.5 | 14 | 2.3 | 33 | 25 | 42 | 7.5 | 28 | M5 x 0.8 | 21 | M10 x 1.0 | 67 | 14.5 | 5.5 | 6 | 9 | 123 |

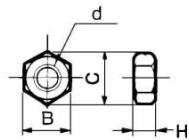
Series CJ2ZW

Flange Style (F)

CJ2ZWF Bore size Stroke



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.


| Bore size (mm) | A | B | D | F | FB | FC | FT | FX | FY | FZ | GA | H | MM | NA | NN | S | WA | WW | Z |
|----------------|----|------|---|---|------|-----|-----|----|----|----|-----|----|----------|----|-----------|----|------|-----|-----|
| 10 | 15 | 15 | 4 | 8 | 14.5 | 4.5 | 1.6 | 24 | 14 | 32 | 7.5 | 28 | M4 x 0.7 | 21 | M8 x 1.0 | 66 | 14.5 | 4.5 | 122 |
| 16 | 15 | 18.3 | 5 | 8 | 19 | 5.5 | 2.3 | 33 | 20 | 42 | 7.5 | 28 | M5 x 0.8 | 21 | M10 x 1.0 | 67 | 14.5 | 5.5 | 123 |

Air Cylinder: Low Friction Type Double Acting, Single Rod

Series CJ2Q

ø10, ø16

How to Order



Without auto switch

CJ2Q

Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Standard stroke (mm)

| | |
|-----|---|
| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Mounting style

| | |
|---|-----------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style |

With auto switch

CDJ2Q


Built-in magnet

J79W

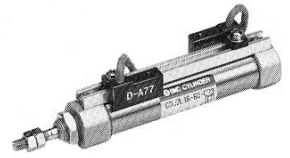
Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Band mounting style



Rail mounting style



Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-57.
* Double clevis style is only available for being perpendicular to axis.

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting style) or "B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2QB16-60-A |
| | Band mounting style | CDJ2QB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).
* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator/light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|--------------------------------------|--------------|--------|---------------------------------|--------------------------|-------|------------------------|----------|----------|-------------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| | | | | | | | Perpendicular | In-line | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | IC circuit | — | |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | | | | |
| | | | | Connector | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | — | Relay, PLC |
| | — | | | | | — | C73C | A73C | — | ● | ● | ● | ● | — | | | |
| | With diagnostic output (2-color indication) | Grommet | | — | — | — | A79W | — | ● | ● | — | — | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | |
| | | Connector | | 2-wire | | | 12 V | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | | — |
| | | | | H7C | | | J79C | — | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | 5 V, 12 V | H7NW | F7NWX | F79W | ● | ● | ○ | — | ○ | IC circuit | | | |
| | | | | 3-wire (PNP) | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | | |
| | | | | Water resistant (2-color indication) | | 2-wire | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | — |
| | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | | |
| | With diagnostic output (2-color indication) | Grommet | | 4-wire (NPN) | 5 V, 12 V | — | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

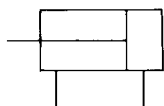
Series CJ2Q

Specially designed to keep friction of the piston to a minimum. Suitable for contact-pressure control requiring smooth operation at low pressures.

Low sliding resistance
Minimum operating pressure: 0.03 MPa



JIS Symbol
Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

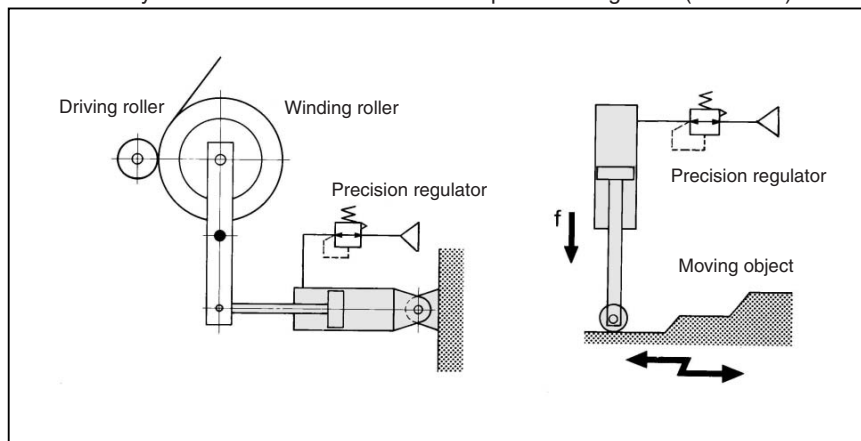
| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Application Example

Low friction cylinder is used in combination with precision regulator (Series IR).



Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.03 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Bore size (mm) | 10, 16 | |
| Mounting | Basic style, Axial foot style Rod side flange style, Double clevis style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate stroke length is available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-3.

Air Cylinder: Low Friction Type Double Acting, Single Rod **Series CJ2Q**

Mounting Style and Accessory/For details, refer to page 6-3-11.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double * clevis style |
|--------------------|------------------------|-------------|------------------|-----------------------|-----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|----------|
| | 10 | 16 |
| Foot bracket | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F010B | CJ-F016B |
| T-bracket * | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |



[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

“D-H7BAL” switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, “BBA4” screws are attached.

Weight

(g)

| Bore size (mm) | | 10 | 16 |
|--|----------------------------------|----|-----|
| Basic weight * | | 24 | 55 |
| Additional weight per each 15 mm of stroke | | 4 | 6.5 |
| Mounting bracket weight | Axial foot style | 8 | 20 |
| | Rod side flange style | 5 | 15 |
| | Double clevis style (With pin) * | 4 | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not attached to the double clevis style, so the mounting nut weight is already subtracted.

Calculation: (Example) CJ2QL10-45

- Basic weight..... 24 (ø10)
- Additional weight..... 4/15 stroke
- Cylinder stroke..... 45 stroke
- Mounting bracket weight..... 8 (Axial foot style)

$$24 + 4/15 \times 45 + 8 = 44 \text{ g}$$

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style. (ø6 is available only as in-line style.)

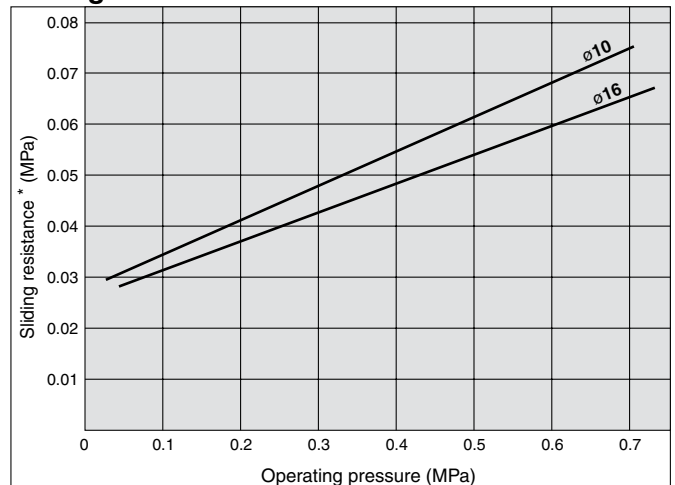


Axial



Perpendicular

Sliding Resistance of the Low Friction Side



* Conversion into the cylinder operating pressure:

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

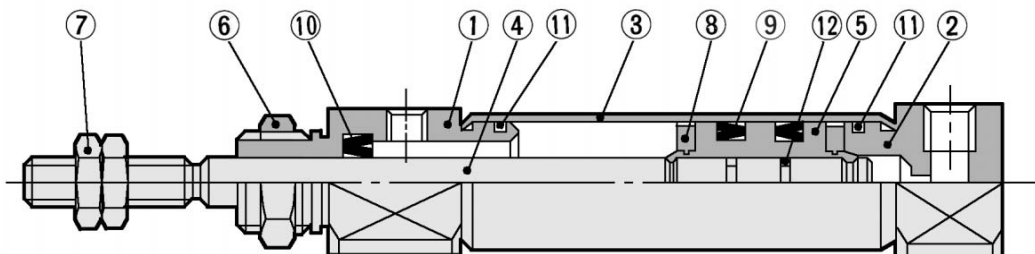
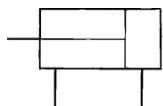
-X

20-

Data

Series CJ2Q

Construction (Not able to disassemble.)



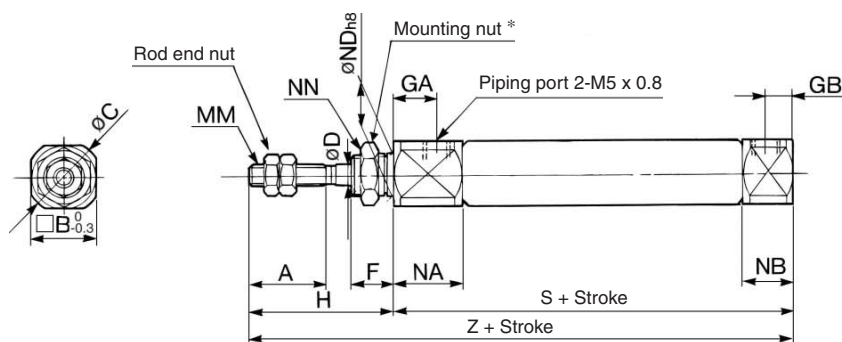
Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Mounting nut | Brass | Nickel plated |

| No. | Description | Material | Note |
|-----|---------------|--------------|------------------|
| ⑦ | Rod end nut | Rolled steel | Nickel plated |
| ⑧ | Bumper | Urethane | |
| ⑨ | Piston seal | NBR | For low friction |
| ⑩ | Rod seal | NBR | For low friction |
| ⑪ | Tube gasket | NBR | |
| ⑫ | Piston gasket | NBR | |

Basic Style (B)

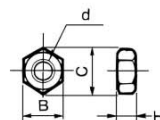
CJ2QB Bore size Stroke Port location on head cover



Piping port
M5 x 0.8

**Port location on head cover:
Axial location (R)**

Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

* For details of the mounting nut, refer to page 6-3-11.

| Bore size (mm) | A | B | C | D | F | GA | GB | H | MM | NA | NB | ND | NN | S | Z |
|----------------|----|------|----|---|---|----|----|----|----------|------|-----|-----------------------------------|-----------|----|----|
| 10 | 15 | 12 | 14 | 4 | 8 | 8 | 5 | 28 | M4 x 0.7 | 12.5 | 9.5 | 8 ⁰ _{-0.022} | M8 x 1.0 | 46 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 8 | 8 | 5 | 28 | M5 x 0.8 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | M10 x 1.0 | 47 | 75 |

For dimensions of each mounting bracket, refer to pages 6-3-8 to 6-3-10.

Air Cylinder: Direct Mount Type

Double Acting, Single Rod

Series CJ2R

ø10, ø16

How to Order

Without auto switch

With auto switch

Band mounting style

Rail mounting style

Bore size

| | 10 | 16 |
|----|-------|-------|
| 10 | 10 mm | |
| 16 | | 16 mm |

Mounting style

A Bottom mounting style

Standard stroke (mm)

| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
|-----|---|
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
 * When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2RB16-60-A |
| | Band mounting style | CDJ2RB10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Ordering Example:

Without auto switch: CJ2RA 16 60

With auto switch: CDJ2RA 16 60 J79W

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-61.

Auto switch

* For the applicable auto switch model, refer to the table below.
 * Auto switch for rail mounting style is shipped together, (but not assembled).
 * If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator/light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|--------------------------|---------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| | | | | | | | | Perpendicular | In-line | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | Relay, PLC | | |
| | 24 V | | | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | | |
| | | | | — | — | C73C | A73C | — | ● | ● | ● | ● | — | | | | |
| | With diagnostic output (2-color indication) | Grommet | | — | — | — | A79W | — | — | ● | ● | — | — | — | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | |
| | | 2-wire | | 12 V | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | — | | |
| | | | | | | | H7C | J79C | — | ● | ● | ● | ● | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | 24 V | 5 V, 12 V | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | |
| | | | | 2-wire | | | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | — |
| | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | |
| | Water resistant (2-color indication) | | | — | F7BAV | — | — | — | ● | ○ | — | — | | | | | |
| | With diagnostic output (2-color indication) | | | | 4-wire (NPN) | 5 V, 12 V | | H7NF | — | F79F | ● | ● | ○ | — | ○ | | IC circuit |

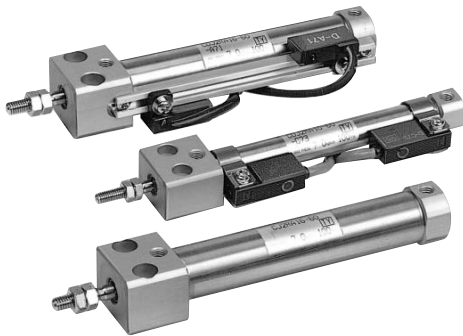
* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

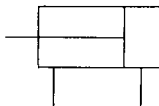
Series CJ2R

Series CJ2R direct mount cylinder can be installed directly through the use of a square rod cover.



JIS Symbol

Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Bore size (mm) | 10, 16 | |
| Mounting | Bottom mounting style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) | Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|----------------------------|--------------------------------------|------------------------------|------------------------------|----------------------------|---------------------------------------|------------------------------|------------------------------|
| Band mounting style | D-C7□ D-C80 | 3 (Same side) | 90 | Rail mounting style | D-A7□ D-A80 | 3 | 35 |
| | | 3 (Different sides) | 55 | | D-A73C D-A80C | 2 | 10 |
| | | 2 (Same side) | 50 | | D-A7□H D-A80H | 1 | 5 |
| | | 2 (Different sides) | 15 | | | 3 | 45 |
| | D-H7□ D-H7□W D-H7BAL D-H7NF | 1 | 10 | | | 2 | 10 |
| | | 3 (Same side) | 105 | | | 1 | 5 |
| | | 3 (Different sides) | 60 | | D-A79W | 3 | 40 |
| | | 2 (Same side) | 60 | | | 2 | 15 |
| | | 2 (Different sides) | 15 | | | 1 | 10 |
| | | 1 | 10 | | | 3 | 45 |
| | D-C73C D-C80C D-H7C | 3 (Same side) | 105 | | D-F7□ D-J79 | 2 | 5 |
| | | 3 (Different sides) | 65 | | | 1 | 5 |
| | | 2 (Same side) | 65 | | D-F7□V D-J79C | 3 | 30 |
| | | 2 (Different sides) | 15 | | | 2 | 5 |
| | | 1 | 10 | | | 1 | 5 |
| | | | | | D-F7□W D-J79W D-F7BAL D-F79F | 3 | 55 |
| | | | | | | 2 | 15 |
| | | | | | | 1 | 10 |
| | | | | | | 3 | 40 |
| | | | | | D-F7□WV D-F7BAVL | 2 | 15 |
| | | | | | | 1 | 10 |

Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series CJ2R**

Weight

| Bore size (mm) | 10 | 16 |
|--|----|------|
| Basic weight * | 36 | 71.5 |
| Additional weight per each 15 mm of stroke | 4 | 6.5 |

* Rod end nut are included in the basic weight.
Calculation: (Example) CJ2RA10-45

- Basic weight 36 (ø10)
 - Additional weight 4/15 stroke
 - Cylinder stroke 45 stroke
- $36 + 4/15 \times 45 = 48 \text{ g}$

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.



Axial



Perpendicular

Auto Switch Mounting Bracket/ Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |



* Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Clean Series

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| 10-CJ2RA | Bore size | Stroke | Port location onhead cover |
|-----------------|------------------|---------------|-----------------------------------|

• Clean Series

Air cylinder which is applicable for the system which discharges leakage from the rod section directly into the outside of clean room by relief port and making an actuator's rod section having a double seal construction.

Specifications

| | |
|----------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 10, 16 |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.08 MPa |
| Cushion | Rubber bumper |
| Standard stroke (mm) | Same as the standard. (Refer to page 6-3-60.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Bottom mounting style |

For details, specifications about the Clean Series, refer to the separate catalog "Pneumatic Clean Series".

Copper-free (For CRT manufacturing process)

| | | | |
|-----------------|------------------|---------------|-----------------------------------|
| 20-CJ2RA | Bore size | Stroke | Port location onhead cover |
|-----------------|------------------|---------------|-----------------------------------|

• Copper-free

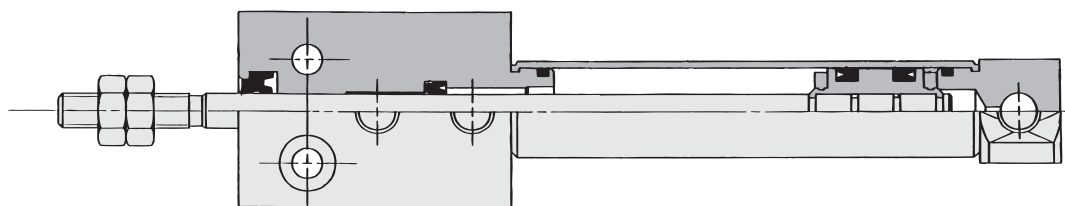
Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube.

Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

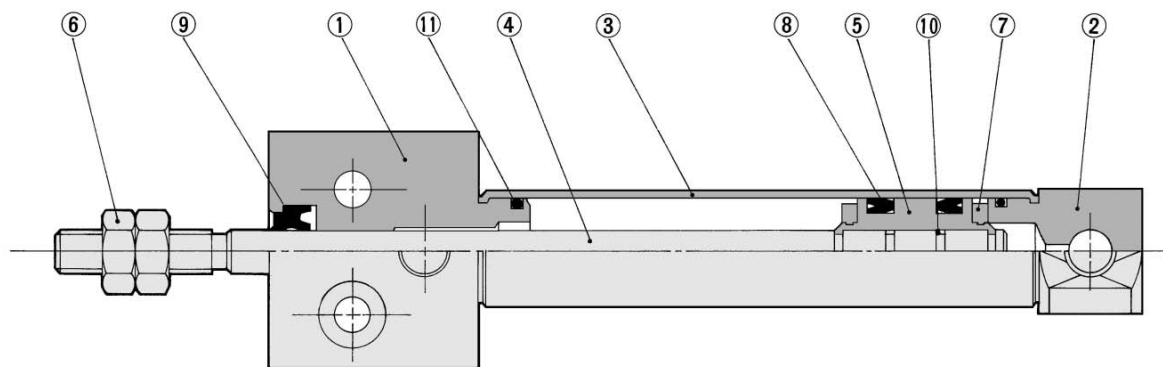
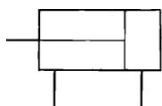
| | |
|----------------------------|--|
| Bore size (mm) | 10, 16 |
| Action | Double acting, Single rod |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.06 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-60.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Bottom mounting style |

Construction (Not able to disassemble.)



Series CJ2R

Construction (Not able to disassemble.)



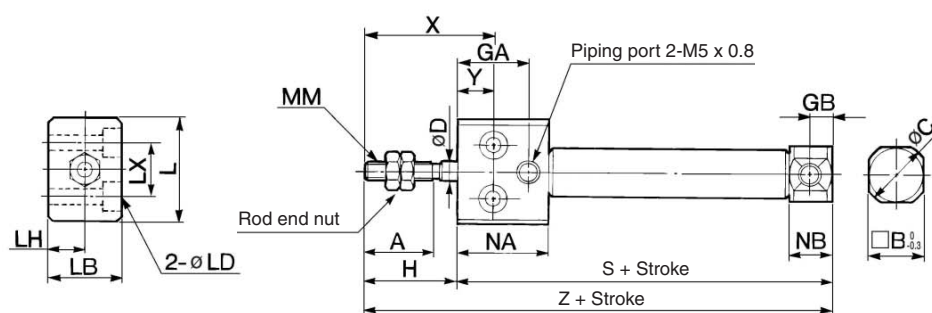
Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Rod end nut | Rolled steel | Nickel plated |

| No. | Description | Material | Note |
|-----|---------------|----------|------|
| ⑦ | Bumper | Urethane | |
| ⑧ | Piston seal | NBR | |
| ⑨ | Rod seal | NBR | |
| ⑩ | Piston gasket | NBR | |
| ⑪ | Tube gasket | NBR | |

Bottom Mounting Style

CJ2RA **Bore size** **Stroke** **Port location on head cover**

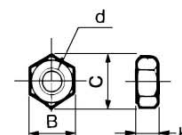


Port location on head cover:
Axial location (R)

Piping port M5 x 0.8



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

| Bore (mm) | A | B | C | D | GA | GB | H | L | LB | LD | LH | LX | MM | NA | NB | X | Y | S | Z |
|-----------|----|------|----|---|----|----|----|----|----|--------------------------------|----|----|----------|------|-----|----|---|----|----|
| 10 | 15 | 12 | 14 | 4 | 16 | 5 | 20 | 23 | 16 | ø3.5, ø6.5 counterbore depth 4 | 8 | 12 | M4 x 0.7 | 20.5 | 9.5 | 28 | 8 | 54 | 74 |
| 16 | 15 | 18.3 | 20 | 5 | 16 | 5 | 20 | 26 | 20 | ø4.5, ø8 counterbore depth 5 | 10 | 16 | M5 x 0.8 | 20.5 | 9.5 | 28 | 8 | 55 | 75 |

Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series CJ2R**

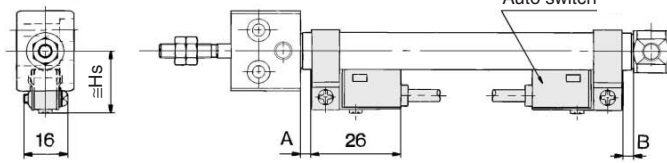
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

For the operating range of auto switch,
refer to page 6-3-13.

Reed switch

<Band mounting style>

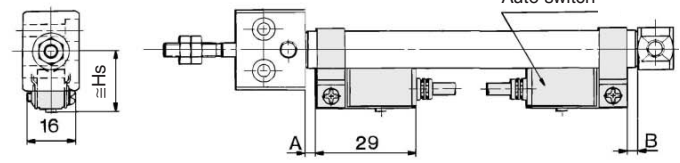
D-C7□/C80



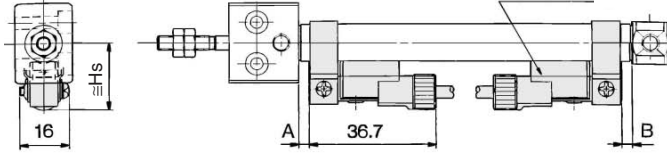
Solid state switch

<Band mounting style>

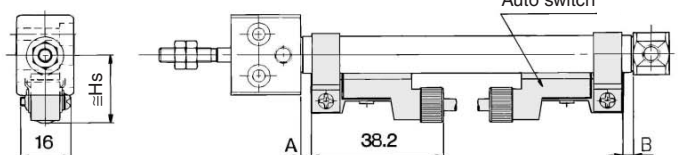
D-H7□/H7□W/H7BAL/H7NF



D-C73C/C80C

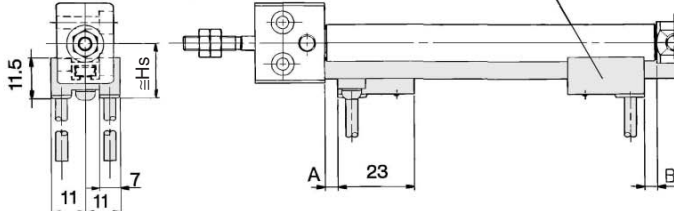


D-H7C



<Rail mounting style>

D-A7□/A80

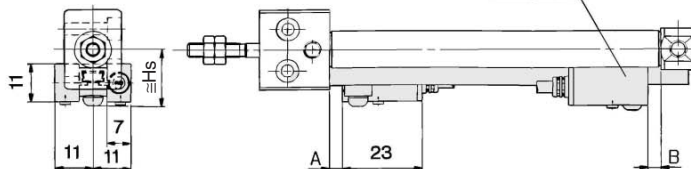


<Rail mounting style>

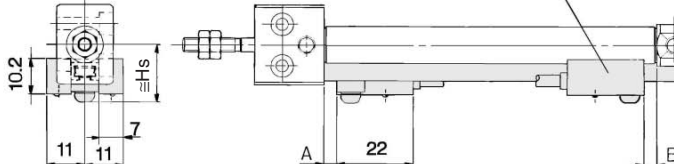
D-F7□/J79

D-F7□W/J79W

D-F79F/F7BAL

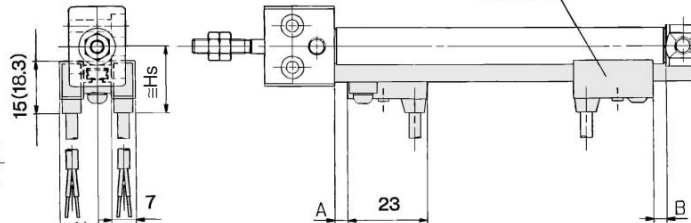


D-A7□H/A80H

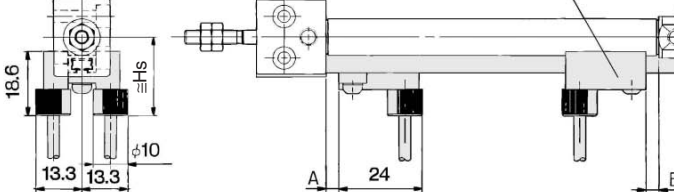


D-F7□V/F7□WV

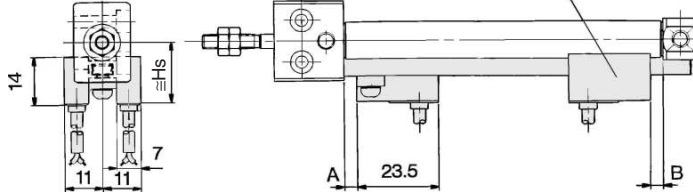
D-F7BAVL



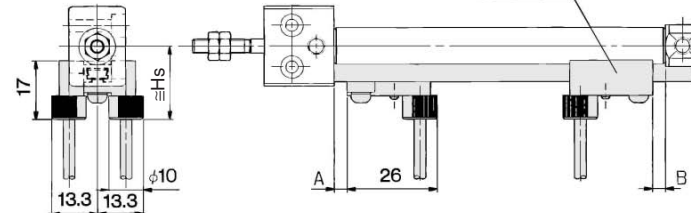
D-A73C/A80C



D-A79W



D-J79C



Proper Auto Switch Mounting Position

| Auto switch model | D-C7□ D-C80 D-C73C D-C80C | | D-H7 D-H7C D-H7□W D-H7BAL D-H7NF | | D-A7□ D-A80 | | D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□W/J79W D-F7□V/F7□WV D-F79F/J79C D-F7BAL D-F7BAVL | | D-A79W | |
|-------------------|------------------------------------|-----|--|-----|----------------|-----|--|-----|--------|-----|
| | A | B | A | B | A | B | A | B | A | B |
| Bore size (mm) | | | | | | | | | | |
| 10 | 2.5 | 2.5 | 1.5 | 1.5 | 3 | 3 | 3.5 | 3.5 | 0.5 | 0.5 |
| 16 | 3 | 3 | 2 | 2 | 3.5 | 3.5 | 4 | 4 | 1 | 1 |

Auto Switch Mounting Height

| Auto switch model | D-C7□/C80 D-H7□/H7□W D-H7NF D-H7BAL | D-C73C D-C80C | D-H7C | D-A7 D-A80 | D-A7□H/A80H D-F7□/J79 D-F7□W/J79W D-F7BAL/F79F | D-A73C D-A80C | D-F7□V D-F7□WV D-F7BAVL | D-J79C | D-A79W |
|-------------------|--|------------------|-------|---------------|---|------------------|-------------------------------|--------|--------|
| Bore size (mm) | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs | Hs |
| 10 | 17 | 19.5 | 20 | 16.5 | 17.5 | 23.5 | 20 | 23 | 19 |
| 16 | 20.5 | 23 | 23.5 | 19.5 | 20.5 | 26.5 | 23 | 26 | 22 |


Air Cylinder: Direct Mount Type

Single Acting, Single Rod, Spring Return/Extend

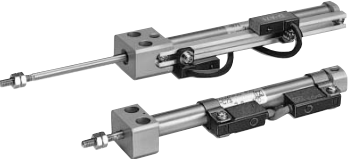
Series CJ2R

ø10, ø16

How to Order



Without auto switch



With auto switch

Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Mounting style

| | |
|---|-----------------------|
| A | Bottom mounting style |
|---|-----------------------|

Standard stroke (mm)

| | |
|-----|-----------------------------------|
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.
* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Built-in Magnet Cylinder Model

Suffix the symbol "A" (Rail mounting style) or "B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|----------------|
| Example | Rail mounting style | CDJ2RA16-60S-A |
| | Band mounting style | CDJ2RA10-45S-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-61.
* Not applicable to single acting, spring extend (T).

Auto switch

* For the applicable auto switch model, refer to the table below.
* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Ordering Example:

Without auto switch: CJ2RA 16-45 S

With auto switch: CDJ2RA 16-45 S J79W

Labels: Built-in magnet, Auto switch

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-------|------------------------------|--------------------------|------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | |
| | Connector | | | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | | | |
| | | | | | — | — | C73C | A73C | — | ● | ● | ● | ● | — | — | | |
| | With diagnostic output (2-color indication) | Grommet | | | — | — | — | A79W | — | — | ● | ● | — | — | — | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | |
| | | 2-wire | | H7B | | | F7BV | J79 | ● | ● | ○ | — | ○ | | | | |
| | Connector | 24 V | | 12 V | H7C | | J79C | — | ● | ● | ● | ● | — | — | | | |
| | | | | 5 V, 12 V | H7NW | | F7NWX | F79W | ● | ● | ○ | — | ○ | | | | |
| | Grommet | 24 V | | 12 V | H7PW | | — | F7PW | ● | ● | ○ | — | ○ | | | | |
| | | | | | H7BW | | F7BWV | J79W | ● | ● | ○ | — | ○ | | | | |
| | | | | | H7BA | | — | F7BA | — | ● | ○ | — | ○ | | | | |
| | | | | | — | | F7BAV | — | — | ● | ○ | — | — | | | | |
| | | | | | 4-wire (NPN) | | 5 V, 12 V | H7NF | — | F79F | ● | ● | ○ | — | ○ | | IC circuit |

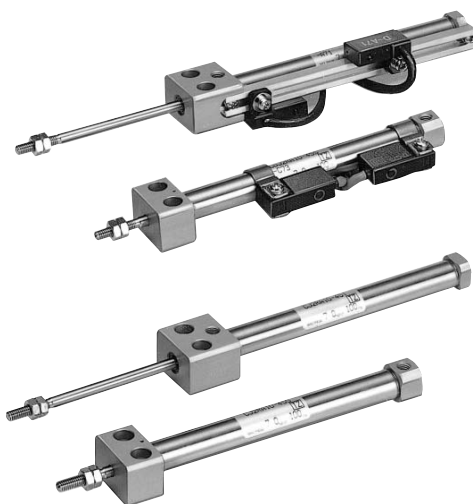
* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Direct Mount Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2R**

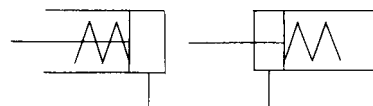
Series CJ2R direct mount cylinder can be installed directly through the use of a square rod cover.



JIS Symbol

Single acting,
Spring return

Single acting,
Spring extend



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

**Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.**

Specifications

| | | |
|-------------------------------|---|------------------------------|
| Action | Single acting, Spring return | Single acting, Spring extend |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.15 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Bore size (mm) | ø10, ø16 | |
| Mounting | Bottom mounting style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|-----------------------------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Accessory/For details, refer to page 6-3-11.

| | |
|--------------------|--|
| Standard equipment | Rod end nut |
| Option | Single knuckle joint, Double knuckle joint * |

* Knuckle pin and snap ring are shipped together with double knuckle joint.

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |



* Mounting screws set made of stainless steel
The following set of mounting screws made of stainless steel is also available.
Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)
BBA4: For D-C7/C8/H7
"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.
When only a switch is shipped independently, "BBA4" screws are attached.

Spring Force

(N)

| Bore size (mm) | Retracted side | Extended side |
|----------------|----------------|---------------|
| 10 | 6.86 | 3.53 |
| 16 | 14.2 | 6.86 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2R

Weight/Spring Return

(g)

| Bore size (mm) | | 10 | 16 |
|----------------|------------|----|-----|
| Weight * | 15 stroke | 38 | 73 |
| | 30 stroke | 45 | 90 |
| | 45 stroke | 54 | 112 |
| | 60 stroke | 63 | 134 |
| | 75 stroke | — | 155 |
| | 100 stroke | — | 198 |
| | 125 stroke | — | 234 |
| | 150 stroke | — | 260 |

* Rod end nut is included in the weight.

Weight/Spring Extend

(g)

| Bore size (mm) | | 10 | 16 |
|----------------|------------|----|-----|
| Weight * | 15 stroke | 44 | 78 |
| | 30 stroke | 50 | 94 |
| | 45 stroke | 59 | 114 |
| | 60 stroke | 67 | 135 |
| | 75 stroke | — | 154 |
| | 100 stroke | — | 192 |
| | 125 stroke | — | 226 |
| | 150 stroke | — | 250 |

* Rod end nut is included in the weight.

Copper-free (For CRT manufacturing process)

20-CJ2RA Bore size Stroke Action Port location on head cover

• Copper-free

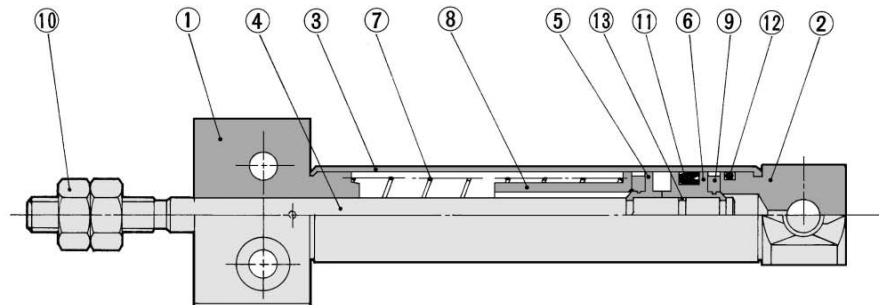
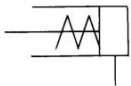
Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

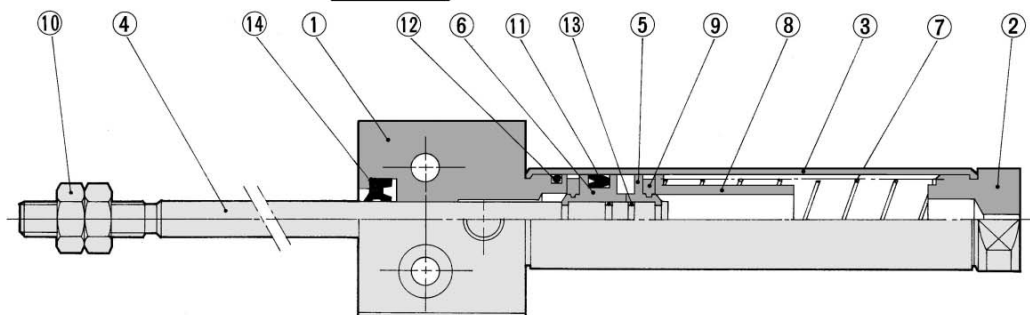
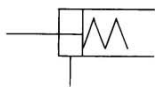
| | |
|-------------------------|--|
| Bore size (mm) | 10/16 |
| Action | Single acting, Spring return; Single acting, Spring extend |
| Max. operating pressure | 0.7 MPa |
| Min. operating pressure | 0.15 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-65.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Bottom mounting style |

Construction (Not able to disassemble.)

CJ2RA□-□S



CJ2RA□-□T



Component Parts

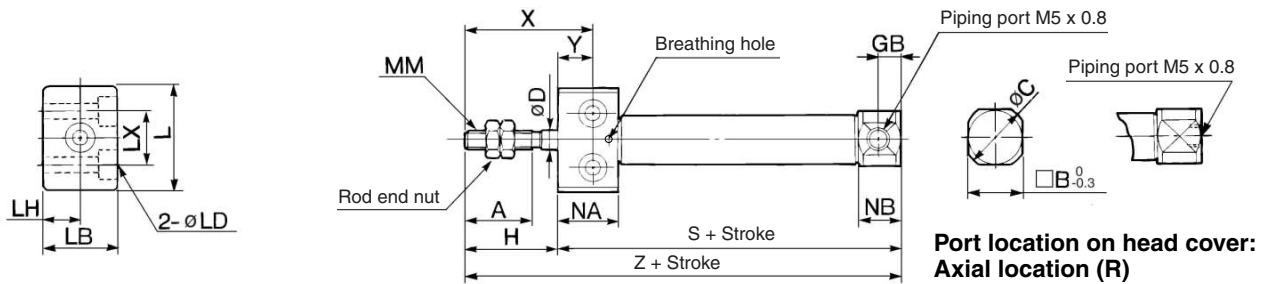
| No. | Description | Material | Note |
|-----|---------------|-----------------|----------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston A | Brass | |
| ⑥ | Piston B | Brass | |
| ⑦ | Return spring | Piano wire | Zinc chromated |

| No. | Description | Material | Note |
|-----|---------------|--------------|---------------|
| ⑧ | Spring seat | Brass | |
| ⑨ | Bumper | Urethane | |
| ⑩ | Rod end nut | Rolled steel | Nickel plated |
| ⑪ | Piston seal | NBR | |
| ⑫ | Tube gasket | NBR | |
| ⑬ | Piston gasket | NBR | |
| ⑭ | Rod seal | NBR | |

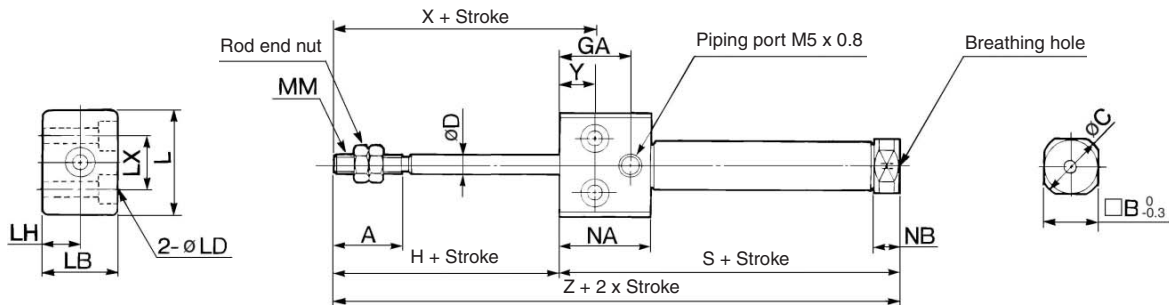
Air Cylinder: Direct Mount Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2R**

Single Acting: Bottom Mounting Style

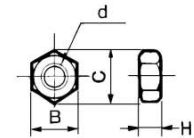
Spring return: CJ2RA **Bore size** **Stroke** **S** **Port location on head cover**



Spring extend: CJ2RA **Bore size** **Stroke** **T**



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

| Bore size (mm) | A | B | C | D | GB | H | L | LB | LD | LH | LX | MM | NA | NB | X | Y |
|----------------|----|------|----|---|----|----|----|----|--------------------------------|----|----|----------|------|-----|----|---|
| 10 | 15 | 12 | 14 | 4 | 5 | 20 | 23 | 16 | ø3.5, ø6.5 counterbore depth 4 | 8 | 12 | M4 x 0.7 | 13.5 | 9.5 | 28 | 8 |
| 16 | 15 | 18.3 | 20 | 5 | 5 | 20 | 26 | 20 | ø4.5, ø8 counterbore depth 5 | 10 | 16 | M5 x 0.8 | 13.5 | 9.5 | 28 | 8 |

Dimensions by Stroke: Spring Return

| Bore size (mm) | Symbol | S | | | | | | | | Z | | | | | | | |
|----------------|--------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | | 53.5 | 61 | 73 | 85 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | | 53.5 | 62 | 74 | 86 | 92 | 116 | 134 | 146 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

Dimensions by Stroke: Spring Extend (Dimensions not mentioned in the below table are the same as the above table.)

| Bore size (mm) | GA | NA | NB | S | | | | | | | | Z | | | | | | | |
|----------------|----|------|-----|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | 16 | 20.5 | 5.5 | 56.5 | 64 | 76 | 88 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | 16 | 20.5 | 5.5 | 56.5 | 65 | 77 | 89 | 95 | 119 | 137 | 149 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

Air Cylinder: Direct Mount, Non-rotating Rod Type Double Acting, Single Rod



Series CJ2RK

ø10, ø16

How to Order



| Bore size | |
|-----------|-------|
| 10 | 10 mm |
| 16 | 16 mm |

| Mounting style | |
|----------------|-----------------------|
| A | Bottom mounting style |

Standard stroke (mm)

| | |
|-----|---|
| ø10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|----------------|
| Example | Rail mounting style | CDJ2RKA16-60-A |
| | Band mounting style | CDJ2RKA10-45-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

CJ2RKA 16 60

With auto switch

CDJ2RKA 16 60 J79W

Built-in magnet

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-70.

Auto switch

* For the applicable auto switch model, refer to the table below.

* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|------------------------------|--------------------------|-------|-----------------------|-------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | Relay, PLC | | |
| | | | | Connector | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | | | — | |
| | Grommet | — | | | | — | — | A79W | — | ● | ● | — | — | | | — | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | 79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | H7A2 | | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | |
| | | Connector | | 2-wire | | | | 12 V | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | |
| | | | | H7C | | | | J79C | — | ● | ● | ● | — | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWW | F79W | ● | ● | ○ | — | ○ | IC circuit | |
| | | 3-wire (PNP) | | H7PW | | | | — | F7PW | ● | ● | ○ | — | ○ | | | |
| | | Grommet | | 2-wire | | | | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | |
| | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | |
| | Water resistant (2-color indication) | Grommet | | 2-wire | | 12 V | | — | F7BAV | — | — | ● | ○ | — | — | — | |
| | | | | | | 5 V, 12 V | | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | |
| | With diagnostic output (2-color indication) | Grommet | | 2-wire | | 12 V | | — | F7BAV | — | — | ● | ○ | — | — | — | |
| | | | | | | 5 V, 12 V | | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Direct Mount, Non-rotating Rod Type Double Acting, Single Rod **Series CJ2RK**

A cylinder which rod does not rotate because of the hexagonal rod shape.

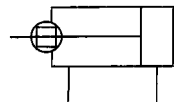
Non-rotating accuracy

ø10: ±1.5°, ø16: ±1°



JIS Symbol

Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | +1.0 0 | |
| Rod non-rotating accuracy | ø10: ±1.5°, ø16: ±1° | |
| Mounting | Bottom mounting style | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Accessory/For details, refer to page 6-3-11.

| | |
|--------------------|--|
| Standard equipment | Rod end nut |
| Option | Single knuckle joint, Double knuckle joint * |

* Knuckle pin and snap ring are shipped together with double knuckle joint.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2RK

Weight

(g)

| Bore size (mm) | 10 | 16 |
|--|----|------|
| Basic weight * | 36 | 71.5 |
| Additional weight per each 15 mm of stroke | 4 | 6.5 |

* Rod end nut are included in the basic weight.

Calculation: (Example) CJ2RKA10-45

- Basic weight..... 36 (ø10)
- Additional weight..... 4/15 stroke
- Cylinder stroke..... 45 stroke

$$36 + 4/15 \times 45 = 48 \text{ g}$$

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.



Axial



Perpendicular

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |



* Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(Please order the mounting band separately, since it is not included.)

BBA4: For D-C7/C8/H7

"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Copper-free (For CRT manufacturing process)

20-CJ2RK **Bore size** **Stroke** **Port location on head cover**

• Copper-free

Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube.

Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

| | |
|----------------------------|--|
| Bore size (mm) | 10, 16 |
| Action | Double acting, Single rod |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.06 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-69.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Bottom mounting style |

Caution on Handling

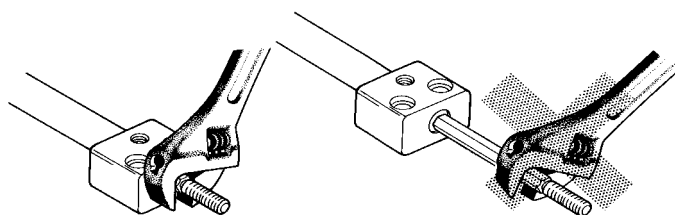
⚠ Caution

<When mounting>

- Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod because this will deform the non-rotating guide, thus affecting the non-rotating accuracy.

| Allowable rotational torque (N·m) | ø10 | ø16 |
|-----------------------------------|------|------|
| | 0.02 | 0.04 |

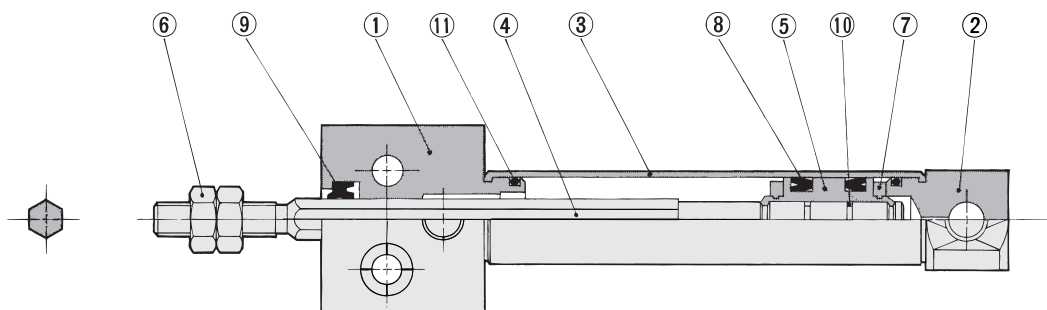
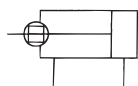
- Operate the cylinder in such a way that the load to the piston rod is always applied in the axial direction.
- To screw a bracket onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



Air Cylinder: Direct Mount, Non-rotating Rod Type

Double Acting, Single Rod **Series CJ2RK**

Construction (Not able to disassemble.)



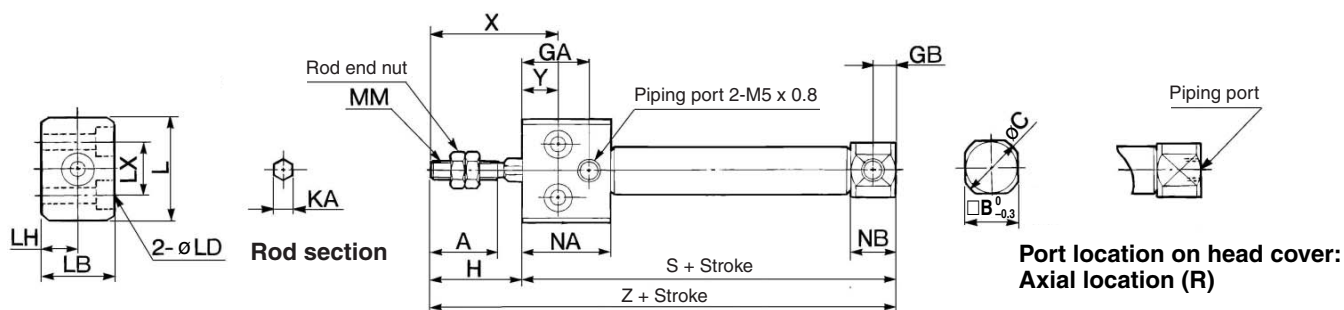
Component Parts

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston | Brass | |
| ⑥ | Rod end nut | Rolled steel | Nickel plated |

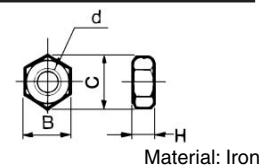
| No. | Description | Material | Note |
|-----|---------------|----------|------|
| ⑦ | Bumper | Urethane | |
| ⑧ | Piston seal | NBR | |
| ⑨ | Rod seal | NBR | |
| ⑩ | Piston gasket | NBR | |
| ⑪ | Tube gasket | NBR | |

Bottom Mounting Style

CJ2RKA Bore size Stroke Port location on head cover



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

| Bore size (mm) | A | B | C | GA | GB | H | KA | L | LB | LD | LH | LX | MM | NA | NB | X | Y | S | Z |
|----------------|----|------|----|----|----|----|-----|----|----|--------------------------------|----|----|----------|------|-----|----|---|----|----|
| 10 | 15 | 12 | 14 | 16 | 5 | 20 | 4.2 | 23 | 16 | ø3.5, ø6.5 counterbore depth 4 | 8 | 12 | M4 x 0.7 | 20.5 | 9.5 | 28 | 8 | 54 | 74 |
| 16 | 15 | 18.3 | 20 | 16 | 5 | 20 | 5.2 | 26 | 20 | ø4.5, ø8 counterbore depth 5 | 10 | 16 | M5 x 0.8 | 20.5 | 9.5 | 28 | 8 | 55 | 75 |

Air Cylinder: Direct Mount, Non-rotating Rod Type

Single Acting, Single Rod, Spring Return/Extend

Series CJ2RK

ø10, ø16



How to Order

Standard stroke (mm)

| | |
|-----|-----------------------------------|
| ø10 | 15, 30, 45, 60 |
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

* When auto switch is mounted, refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Bore size

| | |
|----|-------|
| 10 | 10 mm |
| 16 | 16 mm |

Mounting style

| | |
|---|-----------------------|
| A | Bottom mounting style |
|---|-----------------------|

Action

| | |
|---|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|-----------------|
| Example | Rail mounting style | CDJ2RKA16-60S-A |
| | Band mounting style | CDJ2RKA10-45S-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

CJ2RKA 16 45 S

With auto switch

CDJ2RKA 16 45 S J79W

Built-in magnet

Port location on head cover

| Symbol | Port location on head cover |
|--------|-----------------------------|
| Nil | Perpendicular to axis |
| R | Axial foot style |

* For configuration, refer to page 6-3-70.

* Not applicable to single acting, spring extend (T).

Auto switch

* For the applicable auto switch model, refer to the table below.

* Auto switch for rail mounting style is shipped together, (but not assembled).

* If a built-in magnet cylinder without an auto switch is required, refer to the model of built-in magnet cylinder.

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|--------------|---------------------------------|--------------------------|-------|------------------------|----------|----------|-------------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | Band mounting (ø6, ø10, ø16) | Rail mounting (ø10, ø16) | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| | | | | | | | Perpendicular | In-line | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | Relay, PLC |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | |
| | | | | Connector | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | — | — | — | |
| | Grommet | — | | — | | — | A79W | — | ● | ● | — | — | — | — | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | — | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | 12 V | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | ○ | | |
| | | 2-wire | | | | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | | |
| | | | | Connector | | | | H7C | J79C | — | ● | ● | ● | ● | — | — | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | 24 V | 5 V, 12 V | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | |
| | | | | 2-wire | | | 12 V | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | |
| | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | |
| | Water resistant (2-color indication) | Grommet | | 2-wire | 12 V | — | F7BAV | — | — | ● | ○ | — | — | — | | | |
| | With diagnostic output (2-color indication) | | | | | 4-wire (NPN) | 5 V, 12 V | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

• Since there are other applicable auto switches than listed, refer to page 6-3-13 for details.
 • For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Direct Mount, Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2RK**

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy

ø10: ±1.5°, ø16: ±1°

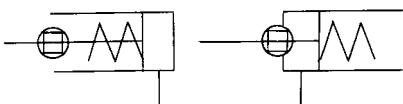
Can operate without lubrication.



JIS Symbol

Single acting,
Single return

Single acting,
Spring extend



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC51 | With hose nipple |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| Action | Single acting, Spring return | Single acting, Spring extend |
|-------------------------------|---|------------------------------|
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.15 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Rod non-rotating accuracy | ø10: ±1.5°, ø16: ±1° | |
| Mounting | Bottom mounting style | |
| Bore size (mm) | 10, 16 | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|-----------------------------------|
| 10 | 15, 30, 45, 60 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150 |

* Intermediate strokes are available by the 1 mm interval with no stroke adjustment by spacer.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-3-60.

Accessory//For details, refer to page 6-3-11.

| | |
|--------------------|--|
| Standard equipment | Rod end nut |
| Option | Single knuckle joint, Double knuckle joint * |

* Knuckle pin and snap ring are shipped together with double knuckle joint.

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |



* Mounting screws set made of stainless steel
The following set of mounting screws made of stainless steel is also available.
Use it in accordance with the operating environment.
(Please order the mounting band separately, since it is not included.)
BBA4: For D-C7/C8/H7
"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.
When only a switch is shipped independently, "BBA4" screws are attached.

Spring Force

(N)

| Bore size (mm) | Retracted side | Extended side |
|----------------|----------------|---------------|
| 10 | 6.86 | 3.53 |
| 16 | 14.2 | 6.86 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CJ2RK

Weight/Spring Return

(g)

| Bore size (mm) | | 10 | 16 |
|----------------|------------|----|-----|
| Weight * | 15 stroke | 38 | 73 |
| | 30 stroke | 45 | 90 |
| | 45 stroke | 54 | 112 |
| | 60 stroke | 63 | 134 |
| | 75 stroke | — | 155 |
| | 100 stroke | — | 198 |
| | 125 stroke | — | 234 |
| | 150 stroke | — | 260 |

* Rod end nut is included in the weight.

Weight/Spring Extend

(g)

| Bore size (mm) | | 10 | 16 |
|----------------|------------|----|-----|
| Weight * | 15 stroke | 44 | 78 |
| | 30 stroke | 50 | 94 |
| | 45 stroke | 59 | 114 |
| | 60 stroke | 67 | 135 |
| | 75 stroke | — | 154 |
| | 100 stroke | — | 192 |
| | 125 stroke | — | 226 |
| | 150 stroke | — | 250 |

* Rod end nut is included in the weight.

Copper-free (For CRT manufacturing process)

20-CJ2RKA Bore size Stroke Action Port location on head cover

Copper-free

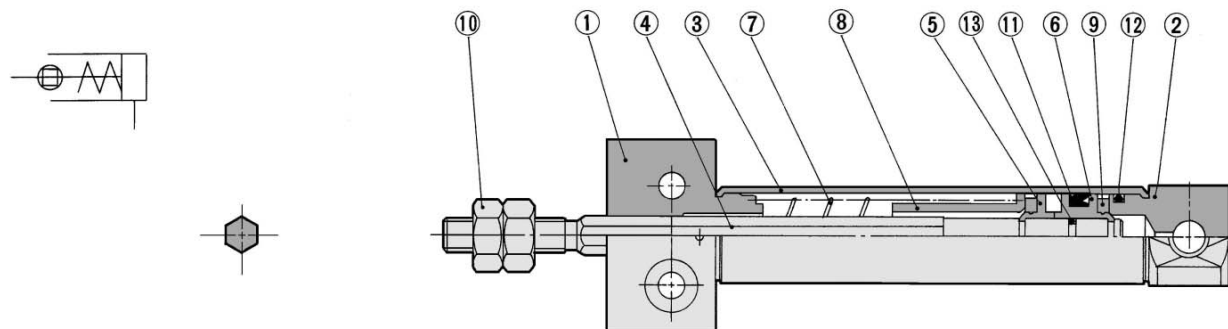
Eliminates the effects by copper based ions and fluorine based resins, etc. over the color cathode ray tube. Making copper based materials into electroless nickel plated treatment or changing them to the non-copper materials in order to prevent copper ions from generating.

Specifications

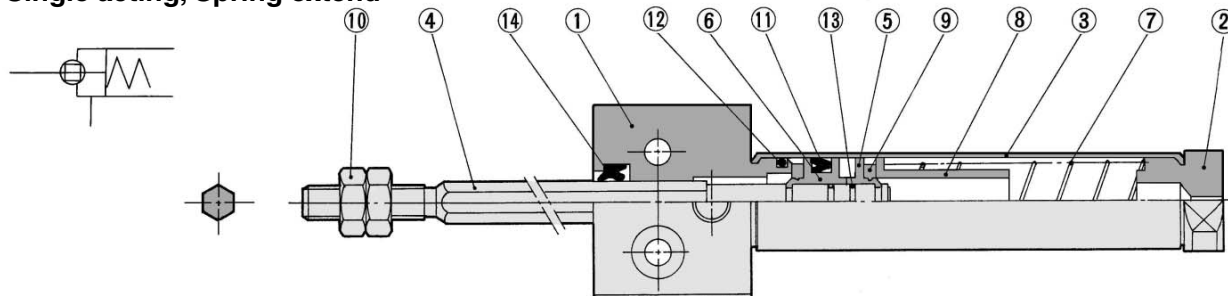
| | |
|-------------------------|---|
| Bore size (mm) | 10, 16 |
| Action | Single acting, Spring return; Single acting, Spring extend |
| Max. operating pressure | 0.7 MPa |
| Min. operating pressure | 0.15 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Standard stroke (mm) | Same as standard type. (Refer to page 6-3-73.) |
| Auto switch | Mountable (Band mounting style) |
| Mounting | Bottom mounting style |

Construction (Not able to disassemble.)

Single acting, Spring return



Single acting, Spring extend



Component Parts

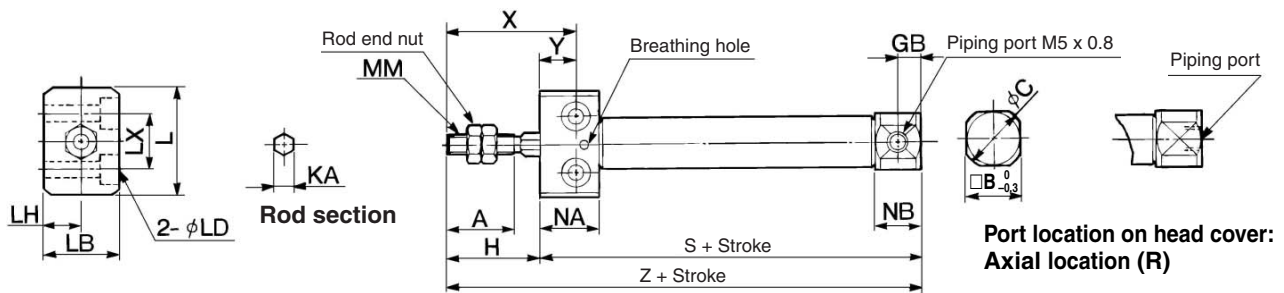
| No. | Description | Material | Note |
|-----|---------------|-----------------|----------------|
| ① | Rod cover | Aluminum alloy | Anodized |
| ② | Head cover | Aluminum alloy | Anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston rod | Stainless steel | |
| ⑤ | Piston A | Brass | |
| ⑥ | Piston B | Brass | |
| ⑦ | Return spring | Piano wire | Zinc chromated |
| ⑧ | Spring seat | Brass | |

| No. | Description | Material | Note |
|-----|---------------|--------------|---------------|
| ⑨ | Bumper | Urethane | |
| ⑩ | Rod end nut | Rolled steel | Nickel plated |
| ⑪ | Piston seal | NBR | |
| ⑫ | Tube gasket | NBR | |
| ⑬ | Piston gasket | NBR | |
| ⑭ | Rod seal | NBR | |

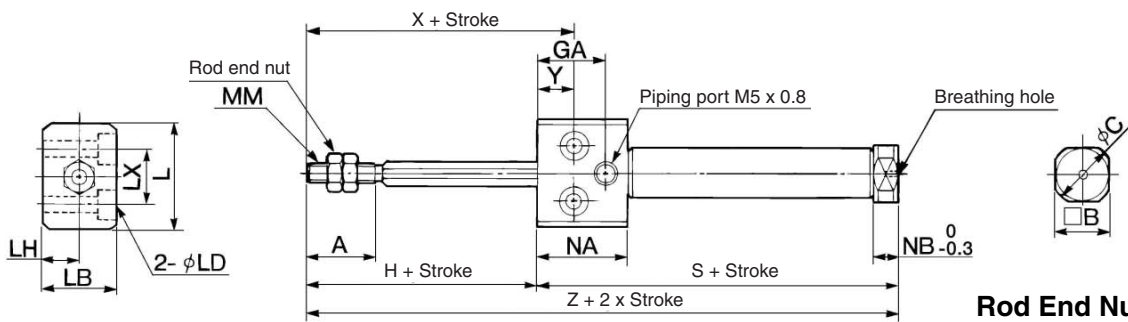
Air Cylinder: Direct Mount, Non-rotating Rod Type Single Acting, Single Rod, Spring Return/Extend **Series CJ2RK**

Single Acting: Bottom Mounting Style

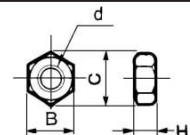
Spring return: CJ2RK Bore size Stroke S Port location on head cover



Spring extend: CJ2RK Bore size Stroke T



Rod End Nut



Material: Iron

| Part no. | Applicable bore (mm) | B | C | d | H |
|----------|----------------------|---|-----|----------|-----|
| NTJ-010A | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015A | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

| Bore size (mm) | A | B | C | GB | H | KA | L | LB | LD | LH | LX | MM | NA | NB | X | Y |
|----------------|----|------|----|----|----|-----|----|----|--------------------------------|----|----|----------|------|-----|----|---|
| 10 | 15 | 12 | 14 | 5 | 20 | 4.2 | 23 | 16 | ø3.5, ø6.5 counterbore depth 4 | 8 | 12 | M4 x 0.7 | 13.5 | 9.5 | 28 | 8 |
| 16 | 15 | 18.3 | 20 | 5 | 20 | 5.2 | 26 | 20 | ø4.5, ø8 counterbore depth 5 | 10 | 16 | M5 x 0.8 | 13.5 | 9.5 | 28 | 8 |

Dimensions by Stroke: Spring Return

| Bore size (mm) | Stroke (mm) | S | | | | | | | | Z | | | | | | | |
|----------------|-------------|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | | 53.5 | 61 | 73 | 85 | — | — | — | — | 73.5 | 81 | 93 | 105 | — | — | — | — |
| 16 | | 53.5 | 62 | 74 | 86 | 92 | 116 | 134 | 146 | 73.5 | 82 | 94 | 106 | 112 | 136 | 154 | 166 |

Dimensions by Stroke: Spring Extend (Dimensions not mentioned in the below table are the same as the above table.)

| Bore size (mm) | GA | NA | NB | S | | | | | | | | Z | | | | | | | |
|----------------|----|------|-----|---------|----------|----------|----------|----------|-----------|------------|------------|---------|----------|----------|----------|----------|-----------|------------|------------|
| | | | | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 | 5 to 15 | 16 to 30 | 31 to 45 | 46 to 60 | 61 to 75 | 76 to 100 | 101 to 125 | 126 to 150 |
| 10 | 16 | 20.5 | 5.5 | 56.5 | 64 | 76 | 88 | — | — | — | — | 76.5 | 84 | 96 | 108 | — | — | — | — |
| 16 | 16 | 20.5 | 5.5 | 56.5 | 65 | 77 | 89 | 95 | 119 | 137 | 149 | 76.5 | 85 | 97 | 109 | 115 | 139 | 157 | 169 |

Air Cylinder: With End Lock

Series CBJ2

ø16

How to Order

Cylinder stroke (mm)

| | |
|-----|---|
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |
|-----|---|

* Intermediate strokes are available in 1 mm increments without stroke adjustment with a spacer.
 * For types with auto switch, refer to Minimum Strokes for Auto Switch Mounting on page 6-3-78.

Mounting Style

| | |
|---|--------------------------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style ^{Note)} |

Note) Front end lock only.

Lock position

| | |
|---|---------------|
| H | Head end lock |
| R | Rod end lock |

Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|--------------|
| Example | Rail mounting style | CDJ2B16-45-A |
| | Band mounting style | CDJ2B16-60-B |

* For rail mounting style, screws and nuts for 2 pcs. switches come with the rail.

Without auto switch

With auto switch

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| N | "n" pcs. |

Auto switch

* Refer to the table below for applicable auto switch.
 * Rail mounting type auto switches are not mounted and are supplied loose at the time of shipment.
 ** For cylinders with built-in magnet and without auto switch, refer to How to Order for cylinders with built-in magnet.

Manual release

| | |
|---|------------------|
| N | Non-locking type |
|---|------------------|

Example part numbers:

Without auto switch: CBJ2 L 16-60 H N

With auto switch: CDBJ2 L 16-60 H N-J79W

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m) | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---------------------------------|---------------------------|-----------------|------------------------|--------------|-----------|-------------------|---------------|-------|----------------------|-------|-------|------------|--------------------|-----------------|------------|-------------|---|
| | | | | | DC | AC | Band mounting | Rail mounting | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (Equiv. to NPN) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | Replay, PLC | |
| | | 2-wire | | — | | 200 V | — | A72 | A72H | ● | ● | — | — | — | | | | |
| | | | | Connector | 24 V | 12 V | 200 V | C73 | A73 | A73H | ● | ● | ● | — | — | — | | |
| | — | | | | | — | C73C | A73C | — | ● | ● | ● | ● | — | — | — | | |
| | Diagnostic indication (2-color) | Grommet | | — | — | — | A79W ** | — | ● | ● | — | — | — | — | — | — | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Replay, PLC | |
| | | | | 3-wire (PNP) | | | | H7A2 | F7PV | F7P | ● | ● | ○ | — | — | | | |
| | | 2-wire | | H7B | | | | F7BV | J79 | ● | ● | ○ | — | — | — | | | |
| | | | | H7C | | | | J79C | — | ● | ● | ● | ● | — | — | | | |
| | Diagnostic indication (2-color) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWV | F79W | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | |
| | | Water resistant (2-color) | | Grommet | | | | 2-wire | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | | — |
| | | | | | | | | | H7BA | — | F7BA | — | ● | ○ | — | ○ | | |
| | Diagnostic output (2-color) | Grommet | | — | 5 V, 12 V | — | F7BAV | — | — | ● | ○ | — | — | — | | | | |
| | H7NF | | | | | — | F79F | ● | ● | ○ | — | ○ | IC circuit | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are manufactured upon receipt of order.
 ** Model D-A79W cannot be mounted on a ø16 cylinder with air cushion.

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 6-3-78.

Series CBJ2

Series CJ2 air cylinder is equipped with end lock function.

Maintains the cylinder's original position even if the air supply interrupted.

When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.



Specifications

| | |
|-------------------------------|--|
| Action | Double acting, Single rod |
| Fluid | Air |
| Proof pressure | 1.05 MPa |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.06 MPa |
| Ambient and fluid temperature | Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C* |
| Cushion | Rubber bumper |
| Lubrication | Not required (Non-lube) |
| Thread tolerance | JIS Class 2 |
| Stroke tolerance | $\begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ |
| Piston speed | 50 to 750 mm/s |
| Allowable kinetic energy | 0.090 J |

* With no freezing

Lock Specifications

| | |
|-----------------------|-------------------|
| Lock position | Head end, Rod end |
| Holding force (Max.) | 98 N |
| Lock release pressure | 0.15 MPa or less |
| Backlash | 1 mm or less |
| Manual release | Non-locking type |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes are available in 1 mm increments without stroke adjustment with a spacer.

Minimum Strokes for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | Number of auto switches | Min. cylinder stroke (mm) | Auto switch mounting style | Auto switch model | Number of auto switches | Min. cylinder stroke (mm) |
|------------------------------|---------------------------------------|-------------------------|---------------------------|------------------------------|------------------------------------|-------------------------|---------------------------|
| Band mounting style (ø16) | D-C7□ D-C80 | 3 (Same side) | 90 | Rail mounting style (ø16) | D-A7□ D-A80 D-A73C D-A80C | 3 | 35 |
| | | 3 (Different sides) | 55 | | | 2 | 10 |
| | | 2 (Same side) | 50 | | | 1 | 5 |
| | | 2 (Different sides) | 15 | | | 3 | 45 |
| | | 1 | 10 | | D-A7□H D-A80H | 2 | 10 |
| | D-H7□ D-H7□W D-H7BAL D-H7NF | 3 (Same side) | 105 | | | 1 | 5 |
| | | 3 (Different sides) | 60 | | | 3 | 40 |
| | | 2 (Same side) | 60 | | D-A79W | 2 | 15 |
| | | 2 (Different sides) | 15 | | | 1 | 10 |
| | | 1 | 10 | | | 3 | 45 |
| | D-C73C D-C80C D-H7C | 3 (Same side) | 105 | | D-F7□ D-J79 | 2 | 5 |
| | | 3 (Different sides) | 65 | | | 1 | 5 |
| | | 2 (Same side) | 65 | | D-F7□V D-J79C | 3 | 30 |
| | | 2 (Different sides) | 15 | | | 2 | 5 |
| | | 1 | 10 | | | 1 | 5 |
| | D-F7□W D-J79W D-F7BAL D-F79F | 3 | 55 | | D-F7□WV D-F7BAVL | 3 | 40 |
| | | 2 | 15 | | | 2 | 15 |
| | | 1 | 10 | | | 1 | 10 |
| | | | | | | | |
| | | | | | | | |

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

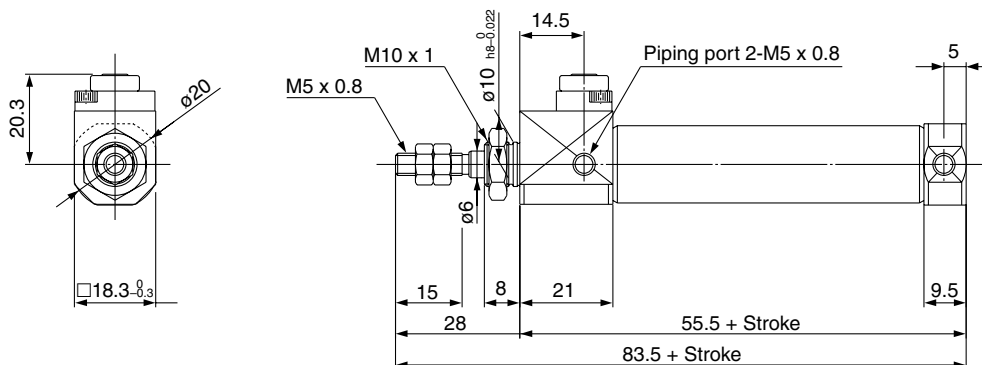
| Type | Model | Electrical entry | Features |
|--------------------|---------|------------------|-------------------------|
| Reed switch | D-A80 | Grommet | Without indicator light |
| | D-A80H | | |
| | D-A80C | Connector | |
| | D-C80 | Grommet | |
| | D-C80C | Connector | |
| Solid state switch | D-F7NTL | Grommet | With timer |

* D-F7NTL is also available with pre-wire connector.

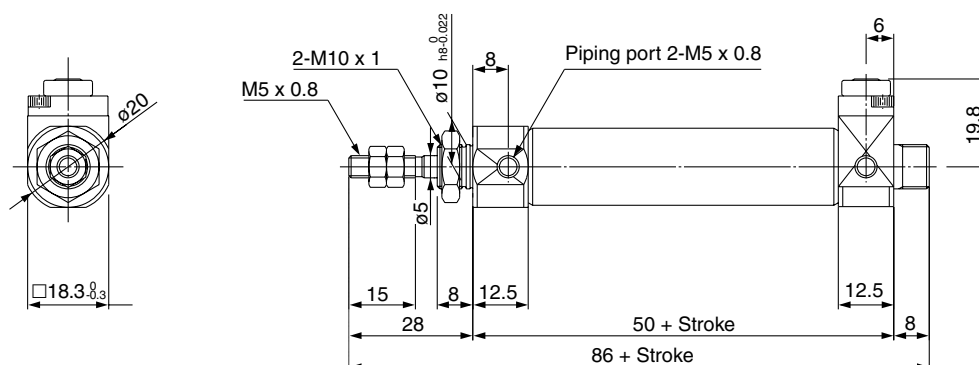
Dimensions

Basic style

With rod end lock: C□BJ2B16-□-RN



With head end lock: C□BJ2B16-□-HN



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

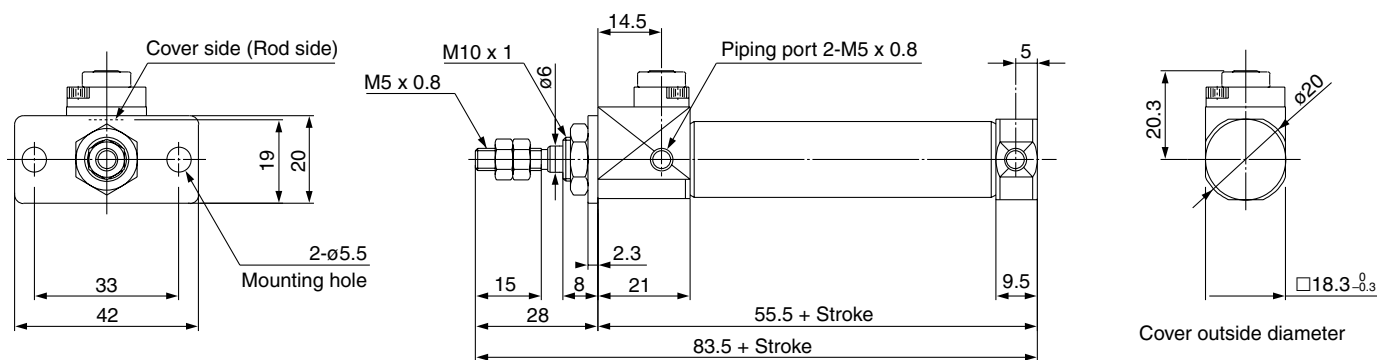
Data

Series CBJ2

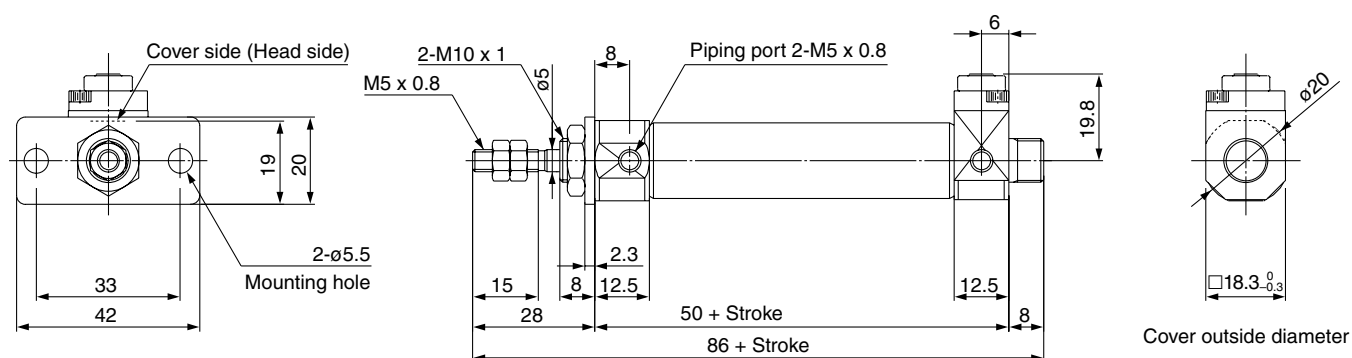
Dimensions

Flange style

With rod end lock: C□BJ2F16-□-RN

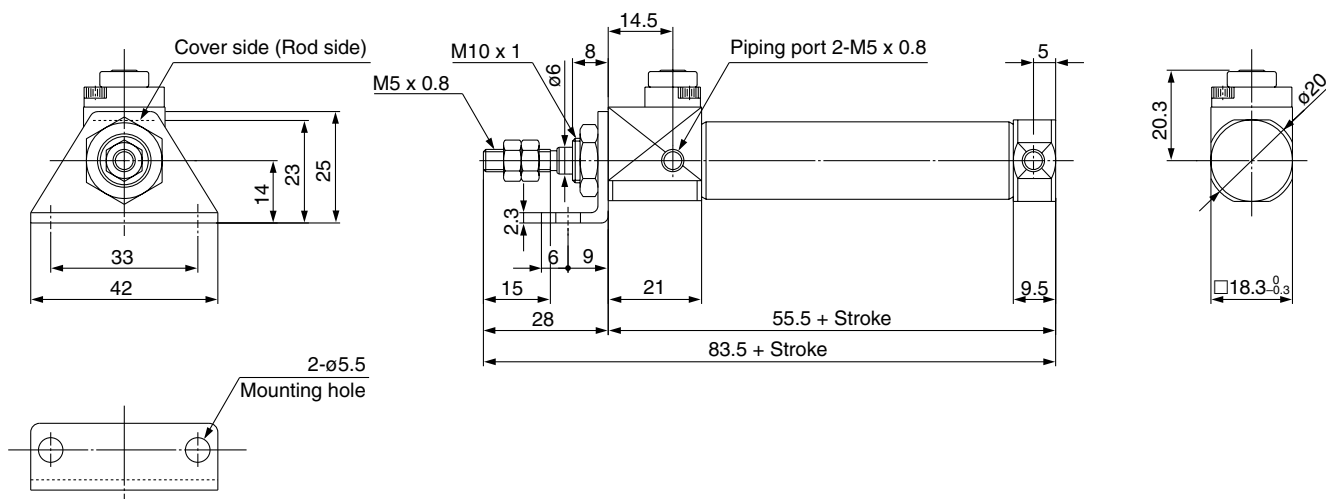


With head end lock: C□BJ2F16-□-HN

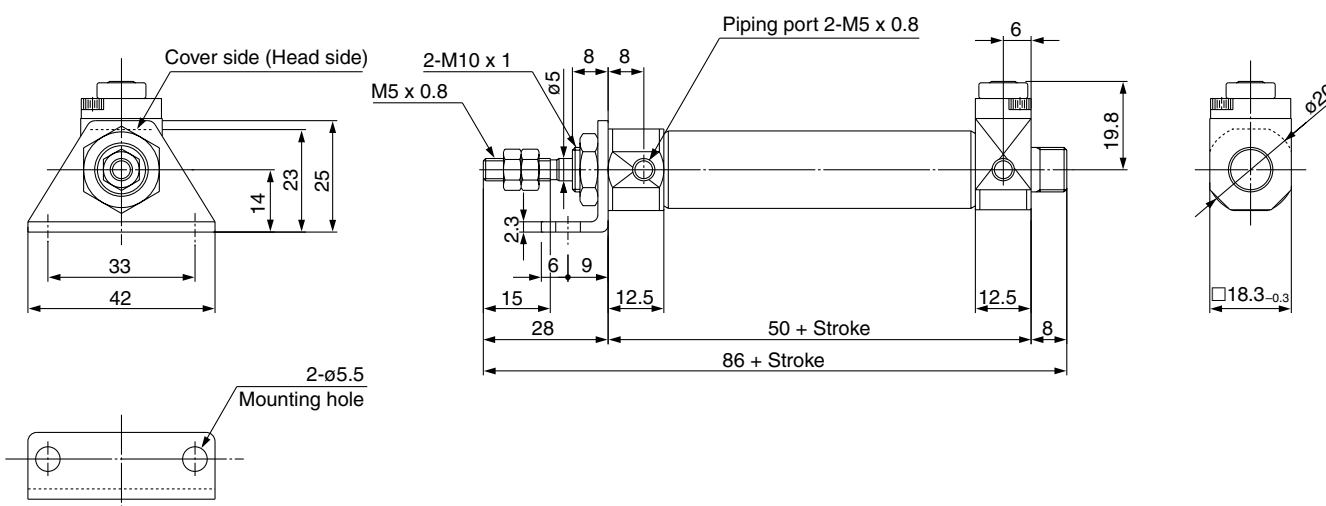


Axial foot style

With rod end lock: C□BJ2L16-□-RN



With head end lock: C□BJ2L16-□-HN



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

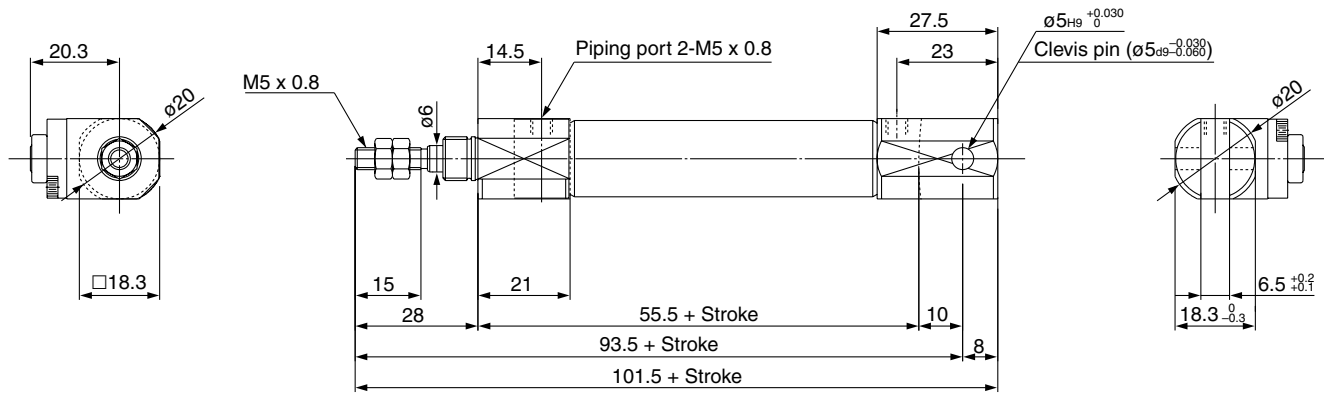
Data

Series CBJ2

Dimensions

Double clevis style

With rod end lock: C□BJ2D16-□-RN



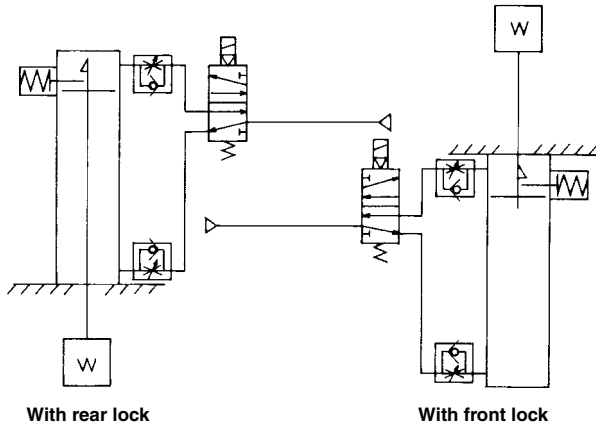
⚠ Precautions

Be sure to read before handling. Please consult with SMC for products outside these specifications.

Use Recommended Air Pressure Circuit.

⚠ Caution

- It is necessary for proper locking and unlocking.



Operating Precautions

⚠ Caution

1. Do not use a 3 position solenoid valve.

Avoid using this cylinder in combination with a 3 position solenoid valve (particularly the closed center metal seal type). If air pressure becomes sealed inside the port on the side that contains the lock mechanism, the lock will not engage. Even if the lock is engaged at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to disengage as time elapses.

2. Back pressure is necessary for unlocking.

Before starting, make sure that air is supplied to the side that is not equipped with a lock mechanism as shown in the diagram above. Otherwise, the lock may not disengage. (Refer to "Rock Disengagement".)

3. Disengage the lock before installing or adjusting the cylinder.

The lock could become damaged if the cylinder is installed with its lock engaged.

4. Operate the cylinder at a load ratio of 50% or less.

The lock might not disengage or might become damaged if a load ratio of 50% is exceeded.

5. Do not synchronize multiple cylinders.

Do not operate two or more end lock cylinders synchronized to move a single workpiece because one of the cylinder locks may not be able to disengage when required.

6. Operate the speed controller under meter-out control.

If operated under meter-in control, the lock might not disengage.

7. On the side that has a lock, make sure to operate at the stroke end of the cylinder.

The lock might not engage or disengage if the piston of the cylinder has not reached the stroke end.

8. The position adjustment of the auto switch should be performed at two positions; a position determined by the stroke and a position after the backlash movement (by 1 mm).

When a 2-color indication switch is adjusted to show green at the stroke end, the indication may turn red when the cylinder returns by the backlash. This, however, is not an error.

Operating Pressure

⚠ Caution

Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

Exhaust Air Speed

⚠ Caution

The lock will engage automatically if the air pressure at the port on the side that has the lock mechanism becomes 0.05 MPa or less. Be aware that if the piping on the side that has the lock mechanism is narrow and long, or if the speed controller is located far from the cylinder port, the exhaust air speed could become slower, involving a longer time for the lock to engage. A similar result will ensure if the silencer that is installed on the exhaust port of the solenoid valve becomes clogged.

Lock Disengagement

⚠ Warning

To disengage the lock, make sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended air pressure circuit.) If the lock is disengaged when the port on the side that does not contain a lock mechanism is in the exhausted state and the load is being applied to the lock mechanism, undue force will be applied to the lock mechanism, and it may damage the lock mechanism. Also, it could be extremely dangerous, because the piston rod could move suddenly.

Manual Disengagement

⚠ Caution

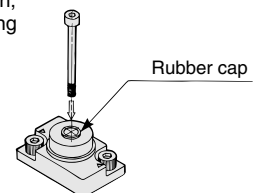
Non-locking style manual release

Insert the bolt, which is provided as an accessory part, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to disengage the lock. Releasing the bolt will re-engage the lock.

The bolt size, pulling force, and the stroke are listed below.

| Bore size (mm) | Thread size | Pulling force | Stroke (mm) |
|----------------|---------------------------|---------------|-------------|
| 16 | M2.5 x 0.45 x 25/ or more | 4.9 | 2 |

Bolt should be detached under normal operation, otherwise it may cause malfunction of the locking feature.



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Fine Lock Cylinder

Double Acting, Single Rod

Series *CLJ2*

ø16

How to Order

Without auto switch

CLJ2 **L** 16 — **60** **R** — **E**

With auto switch

CDLJ2 **L** 16 — **60** **R** — **E** — **H7BW**

Built-in magnet

Mounting style

| | |
|----------|-----------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| D | Double clevis style |

Bore size

| | |
|-----------|-------|
| 16 | 16 mm |
|-----------|-------|

Standard stroke (mm)

| | |
|------------|---|
| ø16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |
|------------|---|

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Lock operation

| | |
|----------|--------------------------------------|
| E | Spring locking (Exhaust locking) |
| P | Pneumatic locking (Pressure locking) |
| D | Spring and pneumatic locking |

Port location on head cover

| | |
|------------|-----------------------|
| Nil | Perpendicular to axis |
| R | Axial direction |

Applicable Auto Switch/Refer to page 9-15-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | | Auto switch model | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | | |
|--------------------|--|------------------|-----------------|---|--------------|-----------|------|-------------------|-----------------------|-----------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | Relay, PLC |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | | | |
| | | | | | | — | C73C | ● | ● | ● | ● | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | | |
| | | 2-wire | | H7B | | | | ● | ● | ○ | — | ○ | | | | |
| | | | | H7C | | | | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 3-wire (PNP) | | | | H7PW | ● | ● | ○ | — | ○ | | | |
| | | | | 2-wire | | | | H7BW | ● | ● | ○ | — | ○ | | | |
| | Water resistant (2-color indication) | Grommet | | | | 2-wire | | 12 V | H7BA | — | ● | ○ | — | ○ | | — |
| | | | | With diagnostic output (2-color indication) | | | | | 4-wire (NPN) | 5 V, 12 V | H7NF | ● | ● | ○ | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 1 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to page 9-2-16 for details.
- For details about auto switches with pre-wire connector, refer to page 9-15-66.

Fine Lock Cylinder Double Acting, Single Rod **Series CLJ2**

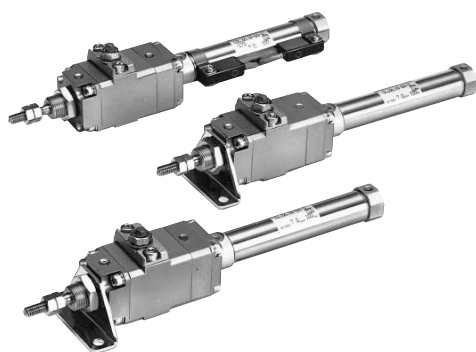
Provided with a compact lock mechanism, it is suitable for intermediate stop, emergency stop, and drop prevention.

Locking in both directions

The piston rod can be locked in either direction of its cylinder stroke.

Maximum piston speed: 500 mm/s

It can be used at 50 to 500 mm/s provided that it is within the allowable kinetic energy range.



Made to Order Specifications
(For details, refer to page 9-16-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Specifications

| | |
|-------------------------------|--|
| Bore size (mm) | 16 |
| Action | Double acting, Single rod |
| Type | Non-lube/Lube |
| Lock operation | Spring locking (Exhaust locking) Pneumatic locking (Pressure locking) Spring and pneumatic locking |
| Fluid | Air |
| Proof pressure | 1.05 MPa |
| Maximum operating pressure | 0.7 MPa |
| Minimum operating pressure | 0.08 MPa |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) |
| Piston speed | 50 to 500 mm/s * |
| Cushion | Rubber bumper |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | +1.0 0 |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style |



* Constraints associated with the allowable kinetic energy are imposed on the speeds at which the piston can be locked.
The maximum speed of 750 mm/s can be accommodated if the piston is to be locked in the stationary state for the purpose of drop prevention.

Fine Lock Specifications

| Lock operation | Spring locking (Exhaust locking) | Spring and pneumatic locking | Pneumatic locking (Pressure locking) |
|----------------------------|-------------------------------------|---------------------------------|---|
| Fluid | Air | | |
| Maximum operating pressure | 0.5 MPa | | |
| Unlocking pressure | 0.3 MPa or more | | 0.1 MPa or more |
| Lock starting pressure | 0.25 MPa or less | | 0.05 MPa or more |
| Locking direction | Both directions | | |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

Mounting Bracket and Accessory/For details, refer to page 9-2-16.

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double clevis style |
|--------------------|---------------------------|-------------|------------------|-----------------------|---------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle (With pin) | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

Mounting Bracket Part No.

| Mounting bracket | Part no. |
|------------------|-----------|
| Foot | CLJ-L016B |
| Flange | CLJ-F016B |
| T-bracket * | CJ-T016B |

* T-bracket is used with double clevis (D).

Auto Switch Mounting Bracket Part No.

| Auto switch mounting bracket no. | Note |
|----------------------------------|----------------|
| BJ2-016 | For D-C7/C8/H7 |



* Mounting screws set made of stainless steel
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.
(A switch mounting band is not included, so please order it separately.)
BBA4: For D-C7/C8/H7
"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped. When only a switch is shipped independently, "BBA4" screws are attached.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

Series CLJ2

Minimum Stroke for Auto Switch Mounting

| Auto switch mounting style | Auto switch model | No. of auto switches mounted | Minimum cylinder stroke (mm) |
|----------------------------|--------------------------------------|------------------------------|------------------------------|
| Band mounting style | D-C7□ D-C80 | 2 (Same side) | 50 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |
| | D-H7□ D-H7□W D-H7NF D-H7BAL | 2 (Same side) | 60 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |
| | D-C73C D-C80C D-H7C | 2 (Same side) | 65 |
| | | 2 (Different sides) | 15 |
| | | 1 | 10 |

Weight

(g)

| Bore size (mm) | | 16 |
|--|-----------------------------------|-----|
| Standard weight * | | 320 |
| Additional weight per each 15 mm of stroke | | 6.5 |
| Mounting bracket weight | Axial foot style | 27 |
| | Rod side flange style | 21 |
| | Double clevis style (With pin) ** | 10 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not included in double clevis style.

Calculation: (Example) CLJ2L16-60

- Basic weight.....320 (ø16)
- Additional weight.....6.5/15 stroke
- Cylinder stroke.....60 stroke

$$320 + 6.5/15 \times 60 + 27 = 373 \text{ g}$$

Stopping Accuracy (Not including tolerance of control system.) (mm)

| Lock type | Piston speed (mm/s) | | | |
|--------------------------------------|---------------------|------|------|------|
| | 50 | 100 | 300 | 500 |
| Spring locking (Exhaust locking) | ±0.4 | ±0.5 | ±1.0 | ±2.0 |
| Pneumatic locking (Pressure locking) | ±0.2 | ±0.3 | ±0.5 | ±1.5 |
| Spring and pneumatic locking | | | | |

Condition: Load: 2 kg

Solenoid valve: Lock port mounting

Port Location on Head Cover

Either perpendicular to the cylinder axis or in-line with the cylinder axis is available for basic style.



Axial



Perpendicular

Caution

Recommended Pneumatic Circuit/Caution on Handling

For detailed specifications of the fine lock cylinder, Series CLJ2 mentioned above, refer to pages 9-2-4 to 9-2-7.

Caution/Allowable Kinetic Energy when Locking

| | |
|------------------------------|------|
| Bore size (mm) | 16 |
| Allowable kinetic energy (J) | 0.17 |

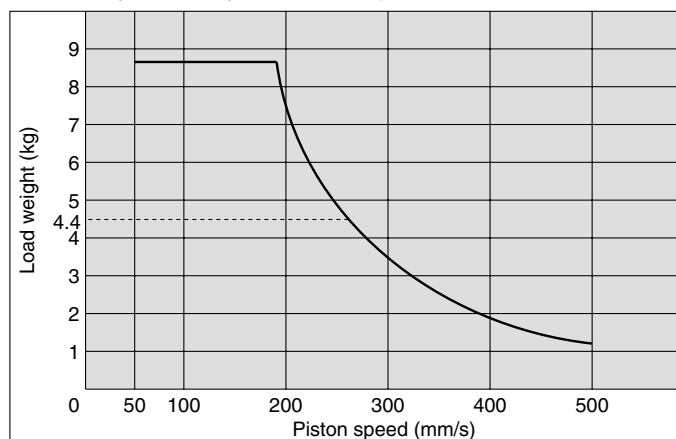
- In terms of specific load conditions, this allowable kinetic energy is equivalent to a load of 3.7 kg in weight, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, there is no need to calculate.
- Apply the following formula to obtain the kinetic energy of the load.

$$E_k = \frac{1}{2} m v^2$$

$$E_k: \text{Kinetic energy of load (J)}$$

$$m: \text{Load weight (kg)}$$

$$v: \text{Piston speed (m/s)}$$
- The piston speed will exceed the average speed immediately before locking. To determine the piston speed for the purpose of obtaining the kinetic energy of load, use 1.2 times the average speed as a guide.
- The relationship between the speed and the load is indicated in the graph below. The area below the line is the allowable kinetic energy range.
- During locking, the lock mechanism must sustain the thrust of the cylinder, in addition to absorbing the energy of the load. Therefore, there is an upper limit to the size of the load that can be sustained. Thus, a horizontally mounted cylinder must be operated below the solid line, and a vertically mounted cylinder must be operated below the dotted line.

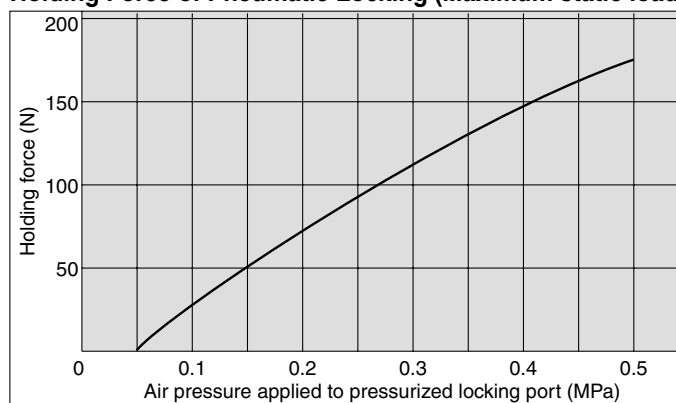


Holding Force of Spring Locking (Maximum static load)

| | |
|-------------------|-----|
| Bore size (mm) | 16 |
| Holding force (N) | 122 |

Note) Holding force at piston rod extended side decreases approximately 15%.

Holding Force of Pneumatic Locking (Maximum static load)



Caution

Caution when Locking

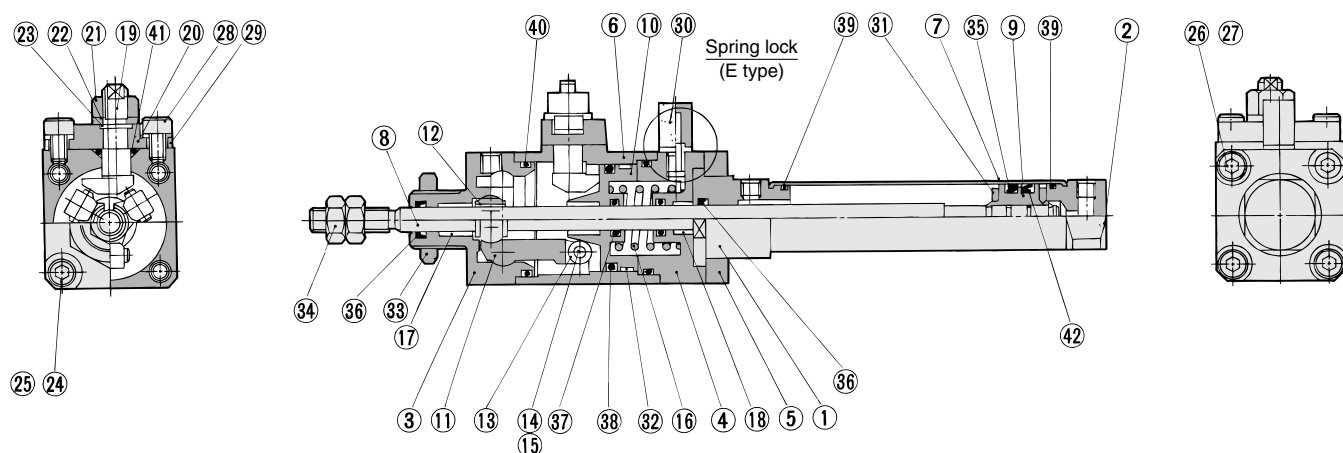
The holding force is the lock's ability to hold a static load that does not involve vibrations or impacts, when it is locked without a load. Therefore, when normally using the cylinder near the upper limit of the holding force, be aware of the points described below.

- If the piston rod slips because the lock's holding force has been exceeded, the brake shoe could be damaged, resulting in a reduced holding force or shortened life.
- To use the lock for drop prevention purposes, the load to be attached to the cylinder must be within 35% of the cylinder's holding force.
- Do not use the cylinder in the locked state to sustain a load that involves impact.

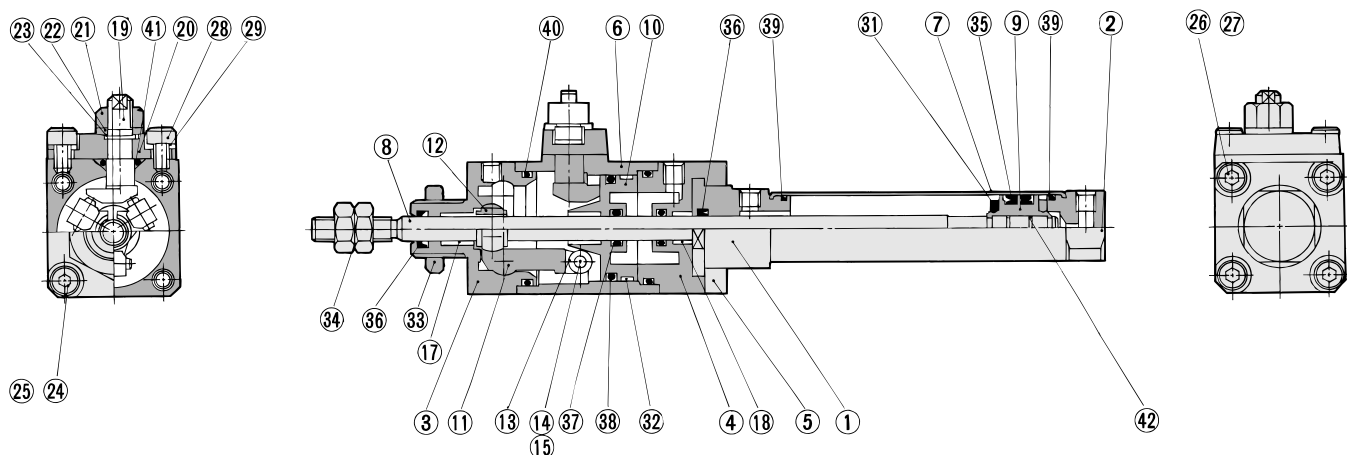
Fine Lock Cylinder Double Acting, Single Rod **Series CLJ2**

Construction (Not able to disassemble.)

Spring locking (Exhaust locking)
Spring and pneumatic locking



Pneumatic locking (Pressure locking)



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|--------------------------------|-----------------------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cover A | Carbon steel | Nitrided, nickel chrome plated |
| ④ | Cover B | Aluminum alloy | Hard anodized |
| ⑤ | Cover C | Aluminum alloy | Hard anodized |
| ⑥ | Intermediate cover | Aluminum alloy | Hard anodized |
| ⑦ | Cylinder tube | Stainless steel | |
| ⑧ | Piston rod | Stainless steel | Hard chrome plated |
| ⑨ | Piston | Brass | |
| ⑩ | Brake piston | Carbon steel | Nitrided |
| ⑪ | Brake arm | Carbon steel | Nitrided |
| ⑫ | Brake shoe | Special friction material | |
| ⑬ | Roller | Carbon steel | Nitrided |
| ⑭ | Pin | Carbon steel | Heat treated |
| ⑮ | Snap ring | Carbon tool steel | Nickel plated |
| ⑯ | Brake spring | Steel wire | Zinc chromated |
| ⑰ | Bushing A | Oil-impregnated sintered alloy | |
| ⑱ | Bushing B | Oil-impregnated sintered alloy | |
| ⑲ | Manual lock release cam | Chromium molybdenum steel | Nitrided |
| ⑳ | Cam guide | Carbon steel | Nitrided, platinum silver painted |
| ㉑ | Lock nut | Rolled steel | Nickel plated |

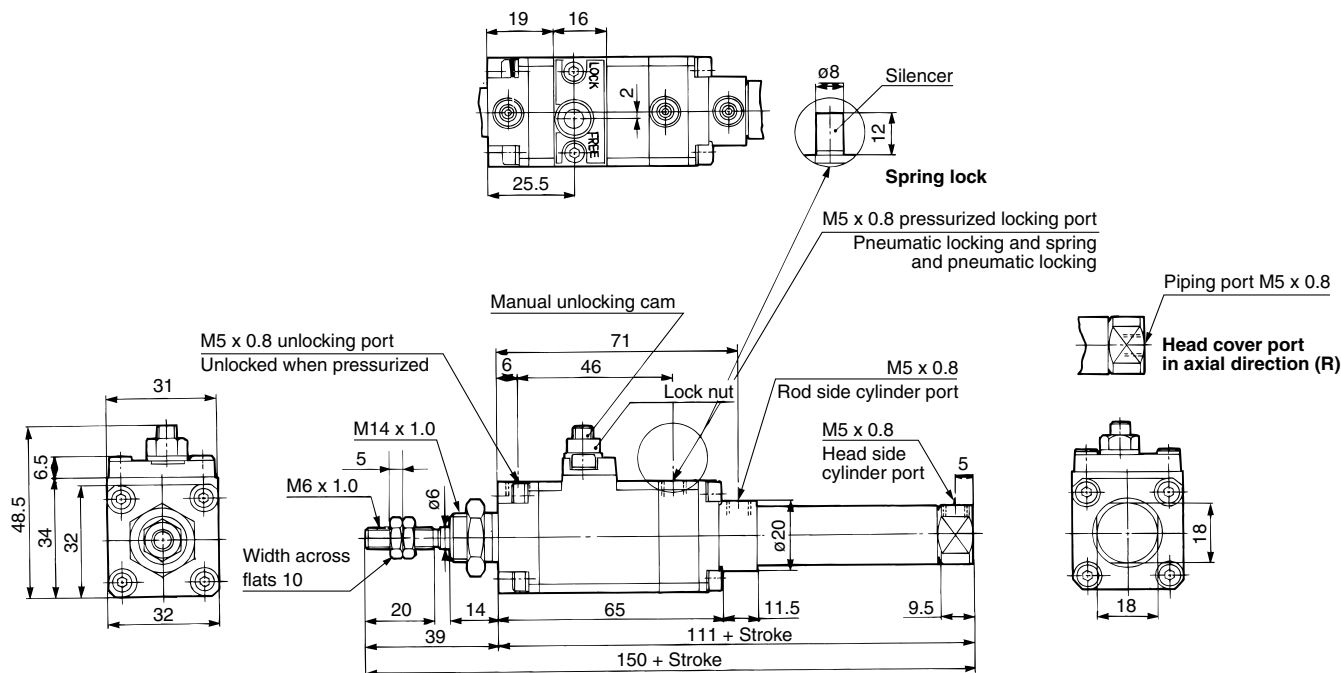
| No. | Description | Material | Note |
|-----|-------------------------------|---------------------------|---------------|
| ㉒ | Plain washer | Rolled steel | Nickel plated |
| ㉓ | Snap ring | Carbon tool steel | Nickel plated |
| ㉔ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |
| ㉕ | Spring washer | Steel wire | Nickel plated |
| ㉖ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |
| ㉗ | Spring washer | Steel wire | Nickel plated |
| ㉘ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |
| ㉙ | Spring washer | Steel wire | Nickel plated |
| ㉚ | Silencer | Bronze | Type E only |
| ㉛ | Bumper | Urethane | |
| ㉜ | Wear ring | Resin | |
| ㉝ | Mounting nut | Brass | Nickel plated |
| ㉞ | Rod end nut | Rolled steel | Nickel plated |
| ㉟ | Piston seal | NBR | |
| ㊱ | Rod seal A | NBR | |
| ㊲ | Rod seal B | NBR | |
| ㊳ | Brake piston seal | NBR | |
| ㊴ | Cylinder tube gasket | NBR | |
| ㊵ | Intermediate cover gasket | NBR | |
| ㊶ | Cam gasket | NBR | |
| ㊷ | Piston gasket | NBR | |

CL
CL1
MLGC
CNG
MNB
CNA
CNS
CLS
CLQ
MLGP
RLQ
MLU
ML1C
D-
-X
20-
Data

Series CLJ2

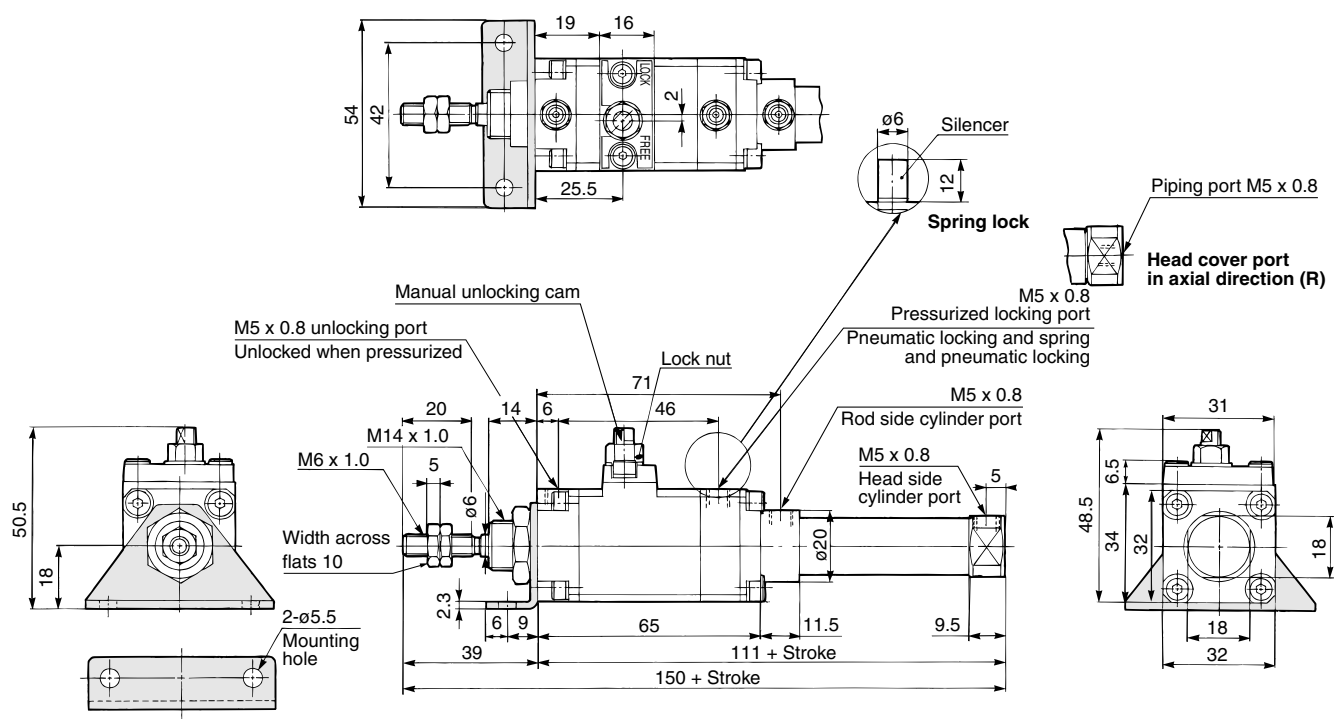
Basic Style (B)

CLJ2B16-□□- $\frac{F}{P}$



Axial Foot Style (L)

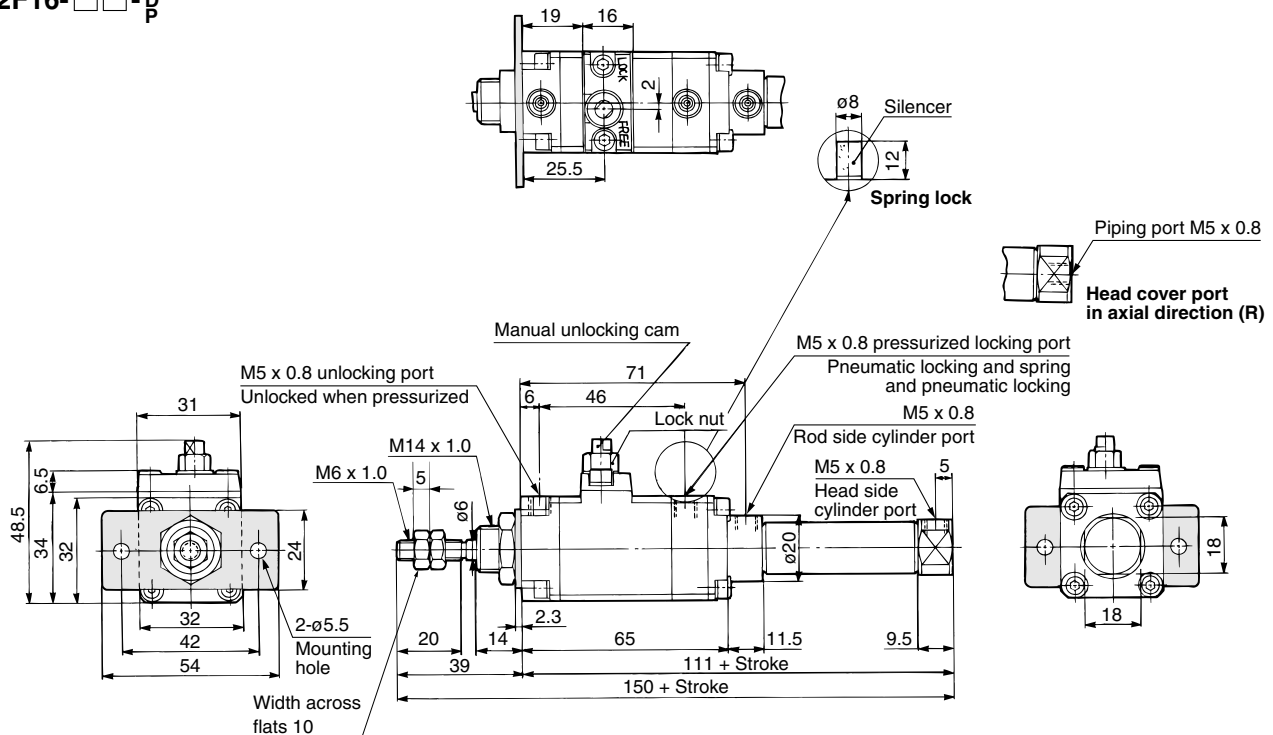
CLJ2L16-□□- $\frac{F}{P}$



Fine Lock Cylinder Double Acting, Single Rod **Series CLJ2**

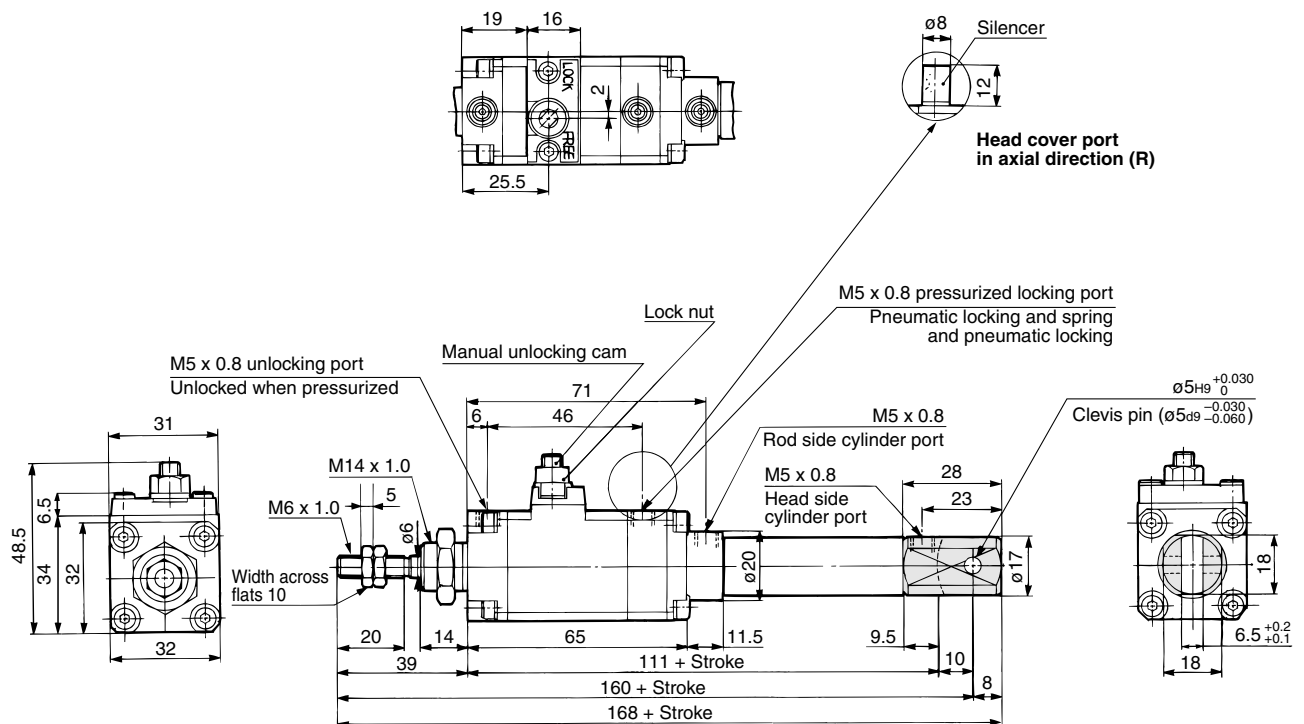
Rod Side Flange Style (F)

CLJ2F16-□□- $\frac{F}{P}$



Double Clevis Style (D) * Clevis pin and set ring are shipped together.

CLJ2D16-□□- $\frac{D}{P}$



CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

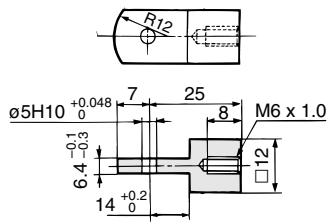
-X

20-

Data

Accessory Bracket Dimensions

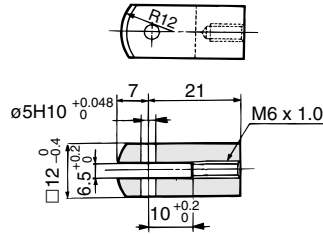
Single Knuckle Joint: I-LJ016B



Material: Rolled steel

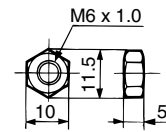
Double Knuckle Joint: Y-LJ016B

* Knuckle pin and snap ring are shipped together.



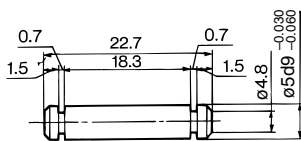
Material: Rolled steel

Rod End Nut: NT-015A



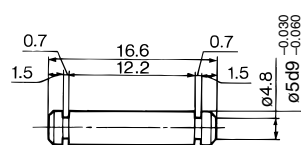
Material: Rolled steel

Clevis Pin: CD-Z015



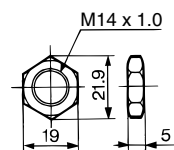
Material: Stainless steel

Knuckle Pin: IY-J015A



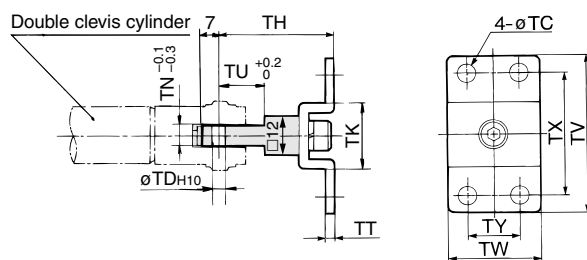
Material: Stainless steel

Mounting Nut: SNLJ-016B



Material: Brass

T-bracket: CJ-T016B



Material: Rolled steel

| Part no. | Bore size (mm) | TC | TD_{H10} | TH | TK | TN | TT | TU | TV | TW | TX | TY |
|----------|----------------|-----|----------------|----|----|-----|-----|----|----|----|----|----|
| CJ-T016B | 16 | 5.5 | $5^{+0.048/0}$ | 35 | 20 | 6.4 | 2.3 | 14 | 48 | 28 | 38 | 16 |

Regarding the installation position and the mounting height of the auto switch, refer to page of Series CDJ2 air cylinder (Double acting, Single rod), since the dimensions are the same.

Note) Applicable auto switches for Fine lock cylinder Series CLJ2 are the band mounting style only.
Use care that auto switch for rail mounting style is not available.



The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CJ2, refer to Best Pneumatics Vol. 6.

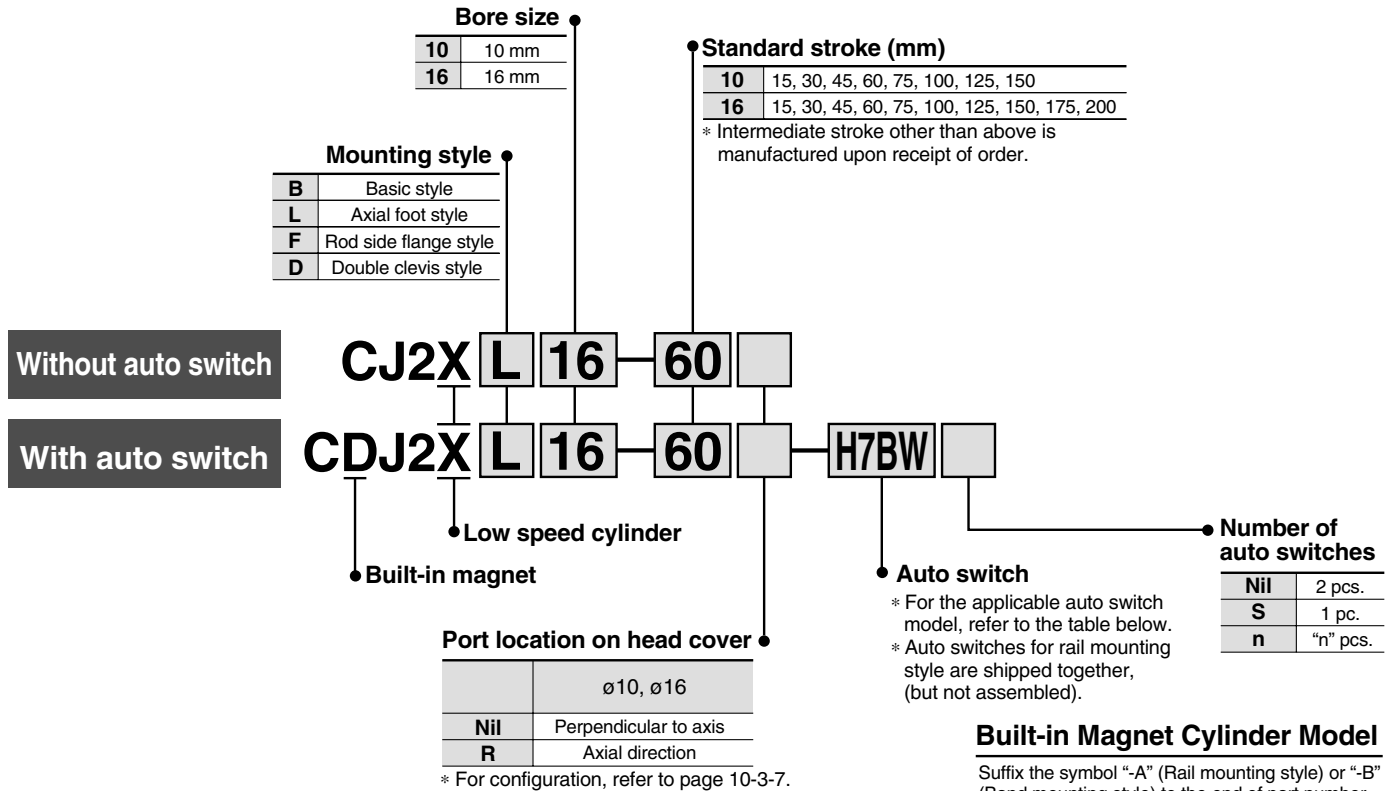
Low Speed Cylinder

Double Acting, Single Rod

Series CJ2X

ø10, ø16

How to Order



Built-in Magnet Cylinder Model

Suffix the symbol "-A" (Rail mounting style) or "-B" (Band mounting style) to the end of part number for cylinder with auto switch.

| | | |
|---------|---------------------|---------------|
| Example | Rail mounting style | CDJ2XB10-45-A |
| | Band mounting style | CDJ2XB16-60-B |

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | | | | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|---------------|---------|-----------------------|-------|-------|----------|--------------------|-----------------|------------|------------|--|--|--|--|
| | | | | | DC | AC | Band mounting | Rail mounting | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | | | |
| | | | | | | | | Perpendicular | In-line | | | | | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | — | A76H | ● | ● | — | — | — | IC circuit | — | | | | |
| | | — | | 200 V | | — | A72 | A72H | ● | ● | — | — | — | — | Relay, PLC | | | | | | |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | A73 | A73H | ● | ● | ● | | | — | — | | | | |
| | 12 V | | | | | — | C73C | A73C | — | ● | ● | ● | ● | | | — | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | — | — | — | A79W | — | ● | ● | — | — | — | — | — | — | — | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | F7NV | F79 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | | | |
| | | 3-wire (PNP) | | H7A2 | | | | F7PV | F7P | ● | ● | ○ | — | ○ | | | | | | | |
| | | Connector | | 2-wire | | | | H7B | F7BV | J79 | ● | ● | ○ | — | ○ | | | | | | |
| | H7C | | | | | J79C | | — | ● | ● | ● | ● | ○ | — | | | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | F7NWW | F79W | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | | | | 3-wire (PNP) | | | | H7PW | — | F7PW | ● | ● | ○ | — | ○ | | | | | | |
| | | | | 2-wire | | | | H7BW | F7BWV | J79W | ● | ● | ○ | — | ○ | — | | | | | |
| | | | | 4-wire (NPN) | | | | H7NF | — | F79F | ● | ● | ○ | — | ○ | IC circuit | | | | | |
| | With diagnostic output (2-color indication) | | | | | | | | | | | | | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

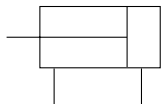
* Solid state switches marked with "○" are produced upon receipt of order.

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

Low Speed Cylinder Double Acting, Single Rod Series CJ2X



JIS Symbol
Double acting,
Single rod



⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

Mounting

⚠ Caution

- During installation, secure the rod cover and tighten by applying an appropriate tightening force to the retaining but or to the rod cover body.
If the head cover is secured or the head cover is tightened, the cover could rotate, leading to the deviation.
- Proper tightening torque for mounting thread should be within the range specified. Apply a Loctite® (no. 242 Blue) for mounting thread.

| Bore size (mm) | Proper tightening torque for mounting thread (N·m) (tightening torque for mounting nut) |
|----------------|---|
| 10 | 3.0 to 3.2 |
| 16 | 5.4 to 5.9 |

- To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring).
Especially with $\phi 10$, use ultra thin pliers, such as Super Tool Corp., CSM-07A.
- For the auto switch mounting rail, do not remove the pre-equipped rail. Since the mounting thread is drilled through inside a the cylinder, it will result in air leakage.

Operating Precautions

⚠ Warning

- It might not be able to control by meter-out at a low speed operation.

⚠ Caution

- For Series CJ2X, 0.1 N ℓ /min is the values at maximum in terms of its construction and there is internal leakage (ANR).

Specifications

| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.06 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper (Standard equipment) | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $+1.0$ 0 | |
| Piston speed | 1 to 300 mm/s | |
| Allowable kinetic energy | $\phi 10$ | 0.035 J |
| | $\phi 16$ | 0.090 J |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

Mounting Style and Accessory

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double* clevis style |
|--------------------|-----------------------|-------------|------------------|-----------------------|----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint* | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Port Location on Head Cover

For basic style, the port position in a head cover is available either perpendicular to the axis or in-line with the cylinder axis.



Axial direction

Perpendicular

Mounting Bracket Part No.

| Mounting bracket | Bore size (mm) | |
|------------------|----------------|----------|
| | 10 | 16 |
| Foot bracket | CJ-L010B | CJ-L016B |
| Flange bracket | CJ-F010B | CJ-F016B |
| T-bracket* | CJ-T010B | CJ-T016B |

* T-bracket is used with double clevis (D).

Auto Switch Mounting Bracket Part No. (Band mounting style)

| Bore size (mm) | Auto switch mounting bracket part no. | Note |
|----------------|---------------------------------------|--|
| 10 | BJ2-010 | Common for the types of D-C7/C8 and D-H7 |
| 16 | BJ2-016 | |

Made to Order Specifications:

-XB13: Low Speed Cylinder

5 to 50 mm/s (CY1: 7 to 50 mm/s)



Symbol

| Low Speed Cylinder | | | | | | | | | | -XB13 | |
|----------------------|--------------------|-----------|--------|-------|--|-------------------------------|--------------------|--|--|-------|--|
| CJ2 | Standard model no. | | | —XB13 | | CY1 | Standard model no. | | | —XB13 | |
| CM2 | Mounting style | Bore size | Stroke | —XB13 | | MGP ^M _L | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | MGGM | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | MGCM | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | CX2 | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | CXW ^M _L | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | CXS ^M _L | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | MXU | Standard model no. | | | —XB13 | |
| | | | | —XB13 | | CXT ^M _L | Standard model no. | | | —XB13 | |
| CG1 | Standard model no. | | | —XB13 | | | | | | | |
| MB | Standard model no. | | | —XB13 | | | | | | | |
| CU | Standard model no. | | | —XB13 | | | | | | | |
| CQ2 | Standard model no. | | | —XB13 | | | | | | | |
| CQS | Standard model no. | | | —XB13 | | | | | | | |
| Low speed cylinder ● | | | | | | | | | | | |

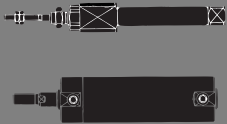
Low speed cylinder ●

Note) Operate without lubrication from a pneumatic system lubricator.

Specifications

| Applicable cylinder | Air cylinder/Standard | | | | Free mount cylinder | Compact cylinder | Compact cylinder | Magnetically coupled rodless cylinder | Compact guide cylinder | Guide cylinder | | Slide unit | | Dual rod cylinder | Compact slide | Platform cylinder |
|---------------------------|---|-----------------------------------|----------------------------|-----------------------------------|----------------------------|---|---|--|---|--------------------------------|------|------------------------------|-------------------------------|-------------------------------|---------------|-------------------------------|
| | | | | | | | | | | Slide bearing | | | | | | |
| Series | CJ2 | CM2 | CG1 | MB | CU | CQ2 | CQS | CY1 | MGP ^M _L | MGGM | MGCM | CX2 | CXW ^M _L | CXS ^M _L | MXU | CXT ^M _L |
| Action | Double acting, Single rod | | | | | Double acting | | | | | | | | | | |
| Bore size (mm) | 6, 10 16 | 20, 25 32, 45 | 20, 25 32, 40 50, 63 | 32, 40 50, 63 80, 100 | 6, 10 16, 20 25, 32 | 12, 16, 20 25, 32, 40 50, 63, 80 100 | 12, 16 20, 25 | CY1B: 6 10, 15, 20 25, 32 40, 50, 63 CY1S, CY1L: 6 to 40 | 12, 16, 20 25, 32, 40 50, 63, 80 100 | 20, 25, 32 40, 50 | | 10, 15 25 | 10, 16, 20 25, 32 | 6, 10 15, 20 25, 32 | 6, 10 16 | 12, 16 20, 25 32, 40 |
| Piston speed | 5 to 50 mm/s | | | | | | | 7 to 50 mm/s | 5 to 50 mm/s | 5 to 50 mm/s | | | | | | |
| Cushion | Rubber bumper | | | Air cushion on both ends | Rubber bumper on both ends | No rubber bumper | No rubber bumper | Rubber bumper on both ends | | Rubber bumper (Basic cylinder) | | Shock absorber (CX2: Option) | | Rubber bumper | | |
| Auto switch | Mountable | | | | | | | | | | | | | | | |
| Mounting | Basic Foot Flange <small>Double clevis</small> | Basic Foot Flange Trunnion Clevis | | Basic Foot Flange Clevis Trunnion | Basic | Basic Foot Flange <small>Double clevis</small> | Basic Foot Flange <small>Double clevis</small> | Basic Slider | Basic | Basic Front mounting Flange | | Basic | | | | |
| Dimensions | Dimensions and specifications are the same as standard products of double acting. Refer to Best Pneumatics Vol. 6, 7 and 8. | | | | | | | | | | | | | | | |
| Additional specifications | | | | | | | | | | | | | | | | |

* No shock absorber is available for the Series MGGM.



Stainless Steel Cylinder

Series CJ5-S $\phi 10, \phi 16$

Series CG5-S $\phi 20, \phi 25, \phi 32, \phi 40, \phi 50, \phi 63, \phi 80, \phi 100$

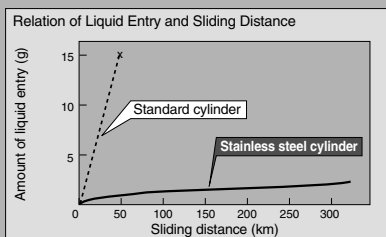
**Applicable for use in an environment
with water splashing such as food processing, etc.**

Uses grease for food processing machines that meets FDA
(U.S. Food and Drug Administration) standards

The use of non-toxic additives allows confident use in equipment for **foods, beverages**
and **medical products**, etc.

All stainless steel specifications (External parts)
Stainless steel 304 is used for external metal parts.
Corrosion resistance is improved even in environments
with exposure to water.

Special scraper (Standard)
Prevents water from entering the cylinder.

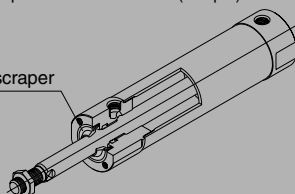


Conditions

Working fluid Air
Pressure 0.5 MPa
Liquid Water-soluble coolant
Piston speed 200 mm/sec (60 cpm)



Special scraper



Two types of seal material

(Nitrile rubber) (Fluoro rubber)

NBR or **FKM** can be selected to
accommodate the application.

Can be disassembled (Series CG5-S)

Since seals are replaceable, thus longer service
life can be enjoyed.
(Before disassembly, be sure to refer to the
section regarding maintenance under
"Specific Product Precautions" on page 10-14-2.)

Exterior configuration reduces residual liquid

- Electropolishing of mounting bracket surfaces makes them smoother to prevent build-up of liquids and foreign matter.
- Plugs are provided for unused mounting threads (Series CG5-S) to prevent residue build-up in the threads.



Series Variations

| Series | Seal material | Bore size (mm) | | | | | | | | | | Applicable auto switch |
|--------|---------------|----------------|----|----|----|----|----|----|----|----|-----|----------------------------|
| | | 10 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | |
| CJ5-S | NBR FKM | ● | ● | | | | | | | | | Water resistant D-H7BAL |
| CG5-S | | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | | | | | | | | | | | Water resistant D-G5BAL |

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^Q

RS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



Series CJ5-S/CG5-S Stainless Steel Cylinder Specific Product Precautions

Be sure to read before handling.

Caution on Design

⚠ Warning

1. Note the weight of the stainless steel products.

Since the weight of stainless steel cylinders is approximately 1.5 to 3 times heavier than the standard products (with aluminum body), be careful when calculating weight estimates. Also, when mounting the cylinder on equipment where vibration is expected, avoid using single side brackets such as the flange style, and use double side brackets such as the foot style instead.

Selection

⚠ Warning

1. Generally, use nitrile rubber (NBR) seals with liquids that do not contain chlorine and sulfur, and use fluoro rubber (FKM) seals with liquids that contain chlorine and sulfur.

However, depending on the type and the brand of liquid (such as cleaning solvent) that splashes on the cylinder, the operating life of seals may be reduced dramatically. In cases where special additives are used, or where liquid caused trouble with the conventional nitrile or fluoro rubber seals in the past, request an investigation or set up a test period for the use of the seals.

2. Even the fluoro rubber specification may not be applicable depending on the type of chemicals and the operating temperature. Therefore, be sure to verify the seal's applicability before use.

Mounting

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

Operating Environment

⚠ Warning

1. Fully consider the compatibility of stainless steel.

The corrosion resistance of stainless steel is not effective against all media and corrosive environments. Corrosion proceeds rapidly with strong hydrochloric acid, hydrofluoric acid, and high temperature ammonium gas, etc. Therefore its compatibility to the environment must be considered carefully.

2. Do not operate cylinders with auto switches in environments where oil and chemicals are used.

Please contact SMC when operating in environments with coolants, cleaning solvents, various oils or chemicals, as it may cause adverse effects (faulty insulation, malfunction due to swelling of the potting resin, and hardening of lead wires, etc) to auto switches even in a short period of time. Even with the fluoro rubber seal specification, the auto switch related parts (switch body, mounting bracket, and built-in magnet) are identical to the standard specifications. Therefore, consult with SMC regarding the cylinder's compatibility (such as chemical resistance) with an environment (chemicals, etc.) before operating.

3. Do not immerse the cylinder in water or chemicals.

When the cylinder is operated in a condition with water pressure, the fluid leaks into the cylinder in the early stages. In the worst case, the fluid may back flow inside the piping and damage the solenoid valve.

Maintenance

⚠ Warning

1. If there is a reduction in grease lubrication and reapplication of grease is necessary, use the special grease shown below.

Grease pack for stainless steel cylinders:

• GR-R-010 (10 g)

Precautions for Series CG5-S

1. Sealant* is used on the threads of the connecting sections of the cover and the cylinder tube for air-tight construction. When disassembling the cylinder, the old sealant must be completely removed, and new sealant must be applied before re-assembling.

* Loctite® 542 (medium strength) or equivalent

2. ø50 or larger bore size cylinders cannot be disassembled.

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)

Technical Data:

Chemical Resistance Table

◎ : No influence or almost no influence
 ○ : Some influence, but operational depending on conditions
 △ : Avoid use if possible
 × : Substantial influence, not suitable for use
 — : Not tested

Chemical Resistance Table

| Parts | | | Body | | Seal | | Water resistant auto switch | |
|--|----|--|---------------------|----------|----------------------|-----------------------|-----------------------------|----------------------|
| Material | | | Stainless steel | Aluminum | Nitrile rubber | Fluoro rubber | Resin casing | Lead wire |
| Chemical (Concentration weight %, Temperature °C) | | | Stainless steel 304 | Al | NBR (-10 to 60°C) | FKM (-40 to 150°C) | PBT (-10 to 60°C) | PVC (-10 to 60°C) |
| Inorganic salt | 1 | Hydrochloric acid (20%, Room temperature) | × | × | ○ | ◎ | ◎ | ○ |
| | 2 | Chromic acid (25%, 70°C) | ○ | × | × | ◎ | ◎ | ○ |
| | 3 | Boric acid | ○ | × | ◎ | ◎ | ◎ | ○ |
| | 4 | Sulfuric acid (30%, Room temperature) | × | × | ◎ | ◎ | ◎ | ○ |
| | 5 | Phosphoric acid (50%, Room temperature) | ○ | × | ◎ | ◎ | ◎ | ○ |
| Inorganic alkali | 6 | Ammonium hydroxide (28%) | ○ | ○ | × | ◎ | ◎ | ○ |
| | 7 | Sodium hydroxide (30%, Room temperature) | ◎ | × | ◎ | △ | ◎ | × |
| | 8 | Calcium hydroxide | △ | × | ◎ | ◎ | ◎ | ◎ |
| | 9 | Magnesium hydroxide | ○ | ○ | ◎ | ◎ | ◎ | ◎ |
| Organic solvent | 10 | Acetylene | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | 11 | Formic acid (25%, Room temperature) | ○ | △ | × | △ | △ | △ |
| | 12 | Citric acid | △ | × | ◎ | ◎ | △ | ○ |
| | 13 | Acetic acid (10%, Room temperature) | ◎ | △ | △ | ○ | ◎ | ○ |
| | 14 | Lactic acid (5%, 20°C) | ○ | × | ◎ | ◎ | ◎ | ○ |
| Others (oil, gas, etc.) | 15 | Linseed oil | ◎ | ○ | ◎ | ◎ | △ | △ |
| | 16 | Potassium chloride | ○ | △ | ◎ | ◎ | ◎ | ◎ |
| | 17 | Calcium chloride | ○ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | 18 | Mineral oil | ◎ | ◎ | ◎ | ◎ | ◎ | △ |
| | 19 | Sodium hypochlorite (2%, Room temperature) | ○ | × | × | ◎ | ◎ | △ |
| | 20 | Sodium chloride | ○ | — | ◎ | ◎ | ◎ | ◎ |
| | 21 | Carbon dioxide | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | 22 | Natural gas | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | 23 | Boric acid | ○ | × | ◎ | ◎ | ◎ | ○ |

* Unless noted otherwise, the solution concentration is in a saturated state.

* Chemical resistance is a guide that applies only to the stainless steel cylinder parts, and does not guarantee the performance of air cylinders (auto switches). Be sure to perform a verification test before operating.

* The temperature range for the protective label cover is between -40 to 110°C, and the temperature range for grease is between -20 to 150°C. (However, there is no relationship with the chemicals listed above.)

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C₅-S

CV

MVGQ

CC

RB

J

D-

-X

20-

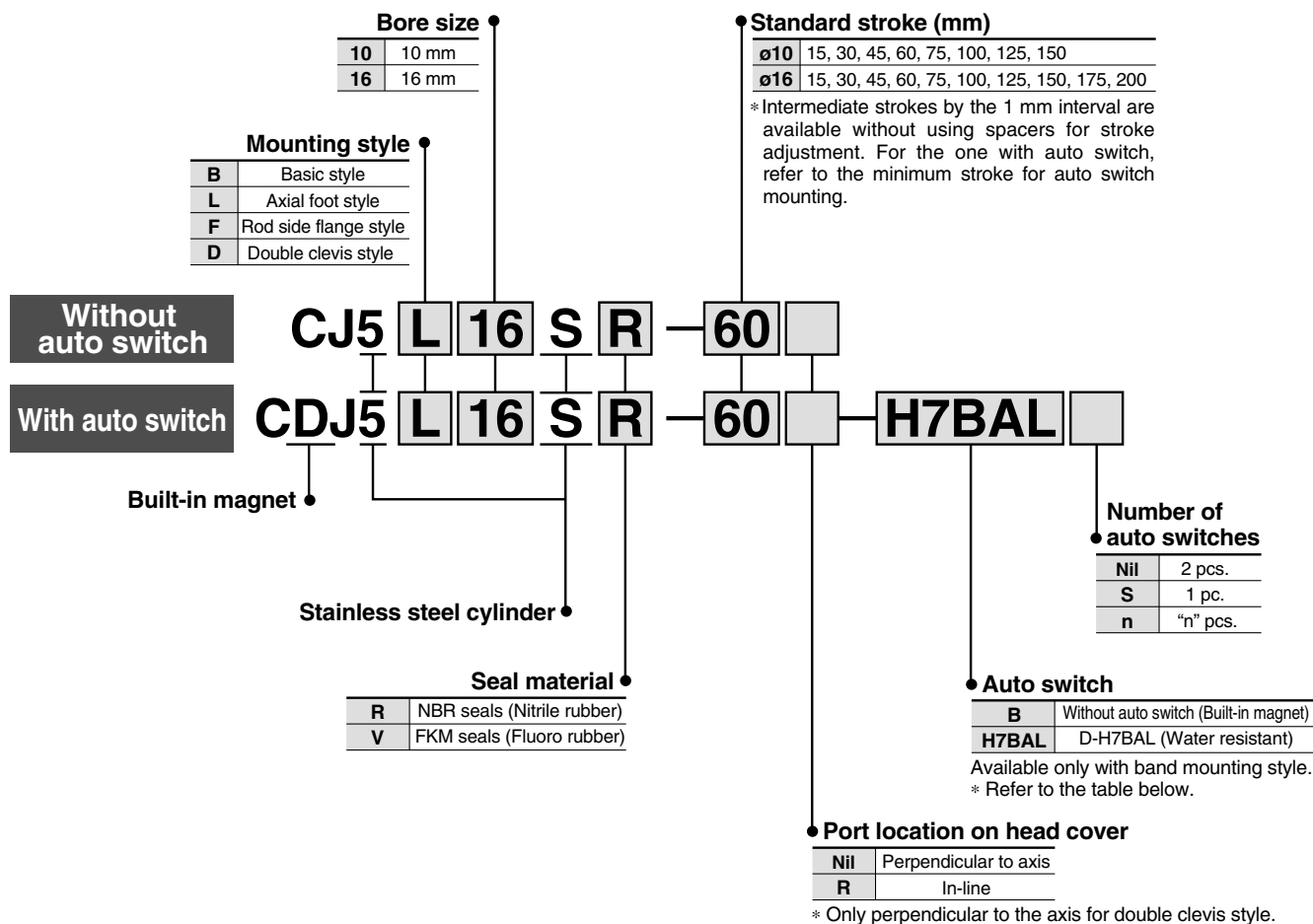
Data

Stainless Steel Cylinder

Series CJ5-S

ø10, ø16

How to Order



Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m)* | | Pre-wire connector | Applicable load |
|--------------------|--------------------------------------|------------------|-----------------|-----------------|--------------|------|-------------------|-----------------------|-------|--------------------|-----------------|
| | | | | | DC | | | 3 (L) | 5 (Z) | | |
| Solid state switch | Water resistant (2-color indication) | Grommet | Yes | 2-wire | 24 V | 12 V | H7BA | ● | ○ | ○ | Relay, PLC |

* Lead wire length symbols: 3 m.....L (Example) H7BAL
5 m.....Z (Example) H7BAZ

* Solid state switches marked with "○" are produced upon receipt of order.

• For details about auto switches with pre-wire connector, refer to page 10-20-66.

Auto Switch Mounting Bracket Part No.

| Bore size (mm) | Auto switch mounting bracket no. | Note |
|----------------|----------------------------------|--|
| 10 | BJ2-010S | With mounting screws made of stainless steel |
| 16 | BJ2-016S | |

Grease pack for stainless steel cylinders/Part no.: GR-R-010 (10 g)

Mounting Bracket Part No.

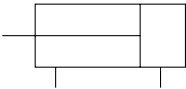
| Mounting bracket | Bore size (mm) | |
|------------------|----------------|-------------|
| | 10 | 16 |
| Foot | CJ-L016SUS | CJK-L016SUS |
| Flange | CJ-F016SUS | CJK-F016SUS |
| T-bracket * | CJ-T010SUS | CJ-T016SUS |

* T-bracket is applicable to the double clevis style (D).

Specifications



JIS Symbol
Double acting,
Single rod



| | | |
|-------------------------------|---|---------|
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.05 MPa | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | 0.1 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | + 1.0 0 | |
| Piston speed | 50 to 750 mm/s | |
| Allowable kinetic energy | ø10 | 0.035 J |
| | ø16 | 0.090 J |
| Mounting | Basic style, Axial foot style, Rod side flange style, Double clevis style | |

Standard Stroke

| Bore size (mm) | Standard stroke |
|----------------|---|
| 10 | 15, 30, 45, 60, 75, 100, 125, 150 |
| 16 | 15, 30, 45, 60, 75, 100, 125, 150, 175, 200 |

* Intermediate strokes by the 1 mm interval are available without using spacers for stroke adjustment.
For the one with auto switch, refer to the minimum stroke for auto switch mounting. (P. 10-14-17)

Mounting Style and Accessory

| Mounting | | Basic style | Axial foot style | Rod side flange style | Double clevis style * |
|--------------------|-----------------------------------|-------------|------------------|-----------------------|-----------------------|
| Standard equipment | Mounting nut | ● | ● | ● | — |
| | Rod end nut | ● | ● | ● | ● |
| | Clevis pin | — | — | — | ● |
| Option | Single knuckle joint | ● | ● | ● | ● |
| | Double knuckle joint (With pin) * | ● | ● | ● | ● |
| | T-bracket | — | — | — | ● |
| | Rod end cap | Flat type | ● | ● | ● |
| | | Round type | ● | ● | ● |

* Pin and snap ring are shipped together with double clevis and double knuckle joint.

Weight

(g)

| Bore size (mm) | | 10 | 16 |
|--|-----------------------------------|----|-----|
| Basic weight * | | 52 | 96 |
| Additional weight per each 15 mm of stroke | | 4 | 6.5 |
| Mounting bracket weight | Axial foot style | 22 | 22 |
| | Rod side flange style | 16 | 16 |
| | Double clevis style (With pin) ** | 6 | 16 |

* Mounting nut and rod end nut are included in the basic weight.

** Mounting nut is not included in double clevis style.

Calculation: (Example) CJ5L10SR-45
 • Basic weight 52 (ø10)
 • Additional weight 4/15 stroke
 • Cylinder stroke 45 stroke
 • Mounting bracket weight 22 (Axial foot type)
 52 + 4/15 x 45 + 22 = 86 g

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^Q

RS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C₅-S

CV

MVGQ

CC

RB

J

D-

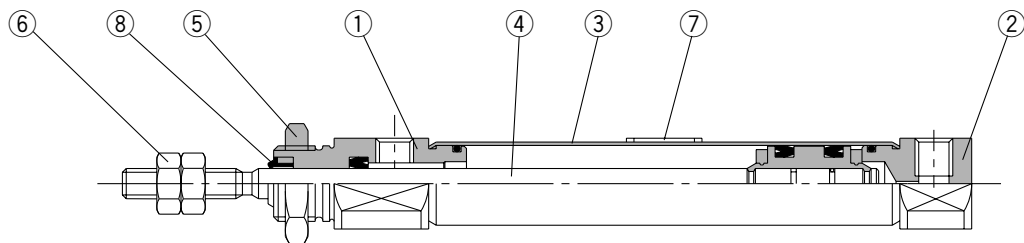
-X

20-

Data

Series CJ5-S

Construction (Not able to disassemble.)

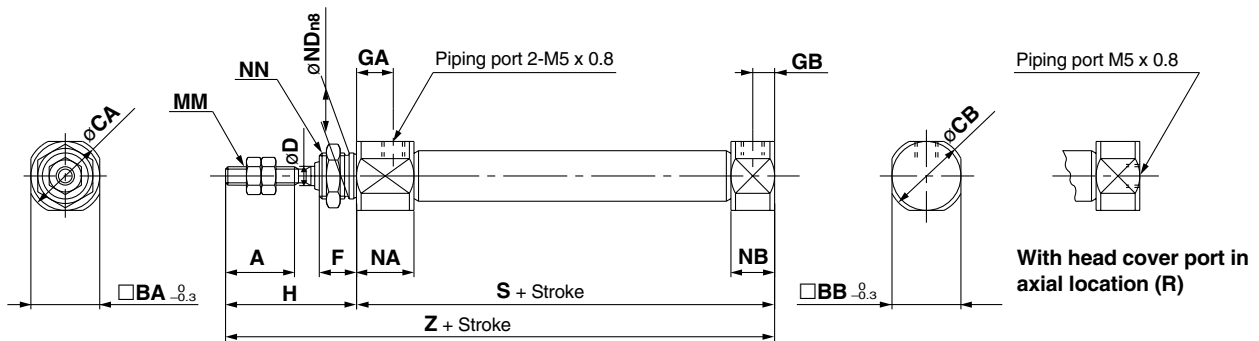


Component Parts

| No. | Description | Material | |
|-----|-------------------------|---------------------|-----|
| ① | Rod cover | Stainless steel 304 | |
| ② | Head cover | Stainless steel 304 | |
| ③ | Cylinder tube | Stainless steel 304 | |
| ④ | Piston rod | Stainless steel 304 | |
| ⑤ | Mounting nut | Stainless steel 304 | |
| ⑥ | Rod end nut | Stainless steel 304 | |
| ⑦ | Label protector | PET | |
| ⑧ | Water resistant scraper | CJ5□□SR | NBR |
| | | CJ5□□SV | FKM |

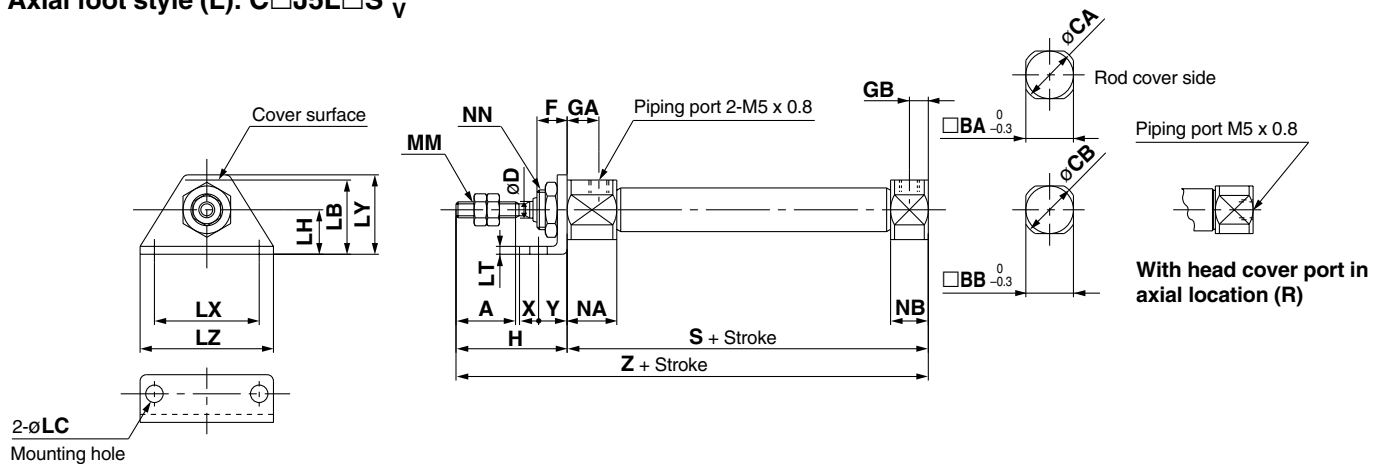
Dimensions

Basic style (B): C□J5B□S^R_V



| Bore size (mm) | A | BA | BB | CA | CB | D | F | GA | GB | H | MM | NN | NA | NB | NDn8 | S | Z |
|----------------|----|------|------|----|----|---|---|----|----|----|----------|-----------|------|-----|-----------------------------------|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 4 | 8 | 8 | 5 | 28 | M4 x 0.7 | M10 x 1.0 | 12.5 | 9.5 | 10 ⁰ _{-0.022} | 46 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 8 | 8 | 5 | 28 | M5 x 0.8 | M12 x 1.0 | 12.5 | 9.5 | 12 ⁰ _{-0.027} | 47 | 75 |

Axial foot style (L): C□J5L□S^R_V



| Bore size (mm) | A | BA | BB | CA | CB | D | F | GA | GB | H | LB | LC | LH | LT | LX | LY | LZ | MM | NN | NA | NB | S | X | Y | Z |
|----------------|----|------|------|----|----|---|---|----|----|----|------|-----|----|-----|----|----|----|----------|-----------|------|-----|----|---|---|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 4 | 8 | 8 | 5 | 28 | 21.5 | 5.5 | 14 | 2.5 | 33 | 25 | 42 | M4 x 0.7 | M10 x 1.0 | 12.5 | 9.5 | 46 | 6 | 9 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 8 | 8 | 5 | 28 | 23 | 5.5 | 14 | 2.5 | 33 | 25 | 42 | M5 x 0.8 | M12 x 1.0 | 12.5 | 9.5 | 47 | 6 | 9 | 75 |

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C^J₅-S

CV

MVGQ

CC

RB

J

D-

-X

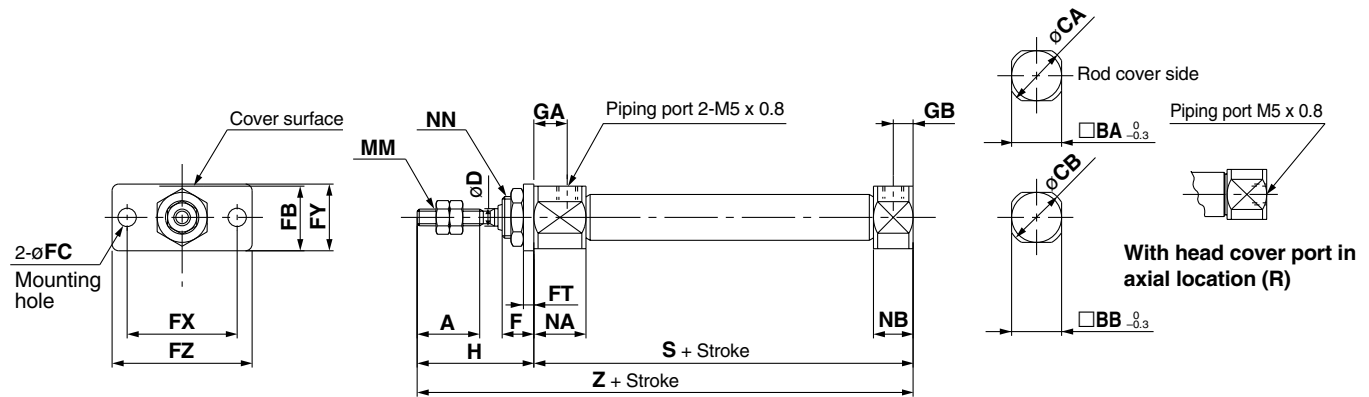
20-

Data

Series CJ5-S

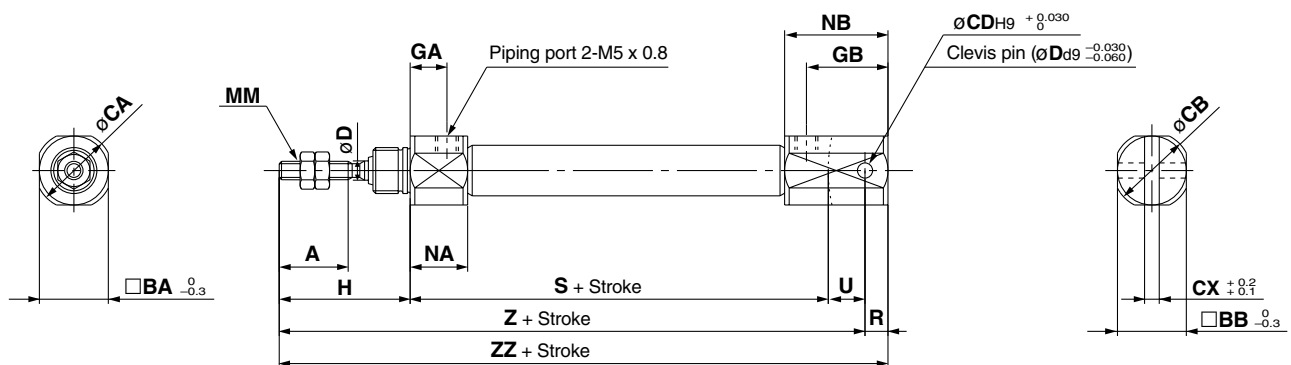
Dimensions

Rod side flange style (F): C□J5F□S^R_V



| Bore size (mm) | A | BA | BB | CA | CB | D | F | FB | FC | FT | FX | FY | FZ | GA | GB | H | MM | NN | NA | NB | S | Z |
|----------------|----|------|------|----|----|---|---|------|-----|-----|----|----|----|----|----|----|----------|-----------|------|-----|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 4 | 8 | 17.5 | 5.5 | 2.5 | 33 | 20 | 42 | 8 | 5 | 28 | M4 x 0.7 | M10 x 1.0 | 12.5 | 9.5 | 46 | 74 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 8 | 19 | 5.5 | 2.5 | 33 | 20 | 42 | 8 | 5 | 28 | M5 x 0.8 | M12 x 1.0 | 12.5 | 9.5 | 47 | 75 |

Double clevis style (D): C□J5D□S^R_V

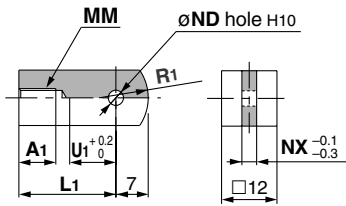


| Bore size (mm) | A | BA | BB | CA | CB | CD (Cd) | CX | D | GA | GB | H | MM | NA | NB | R | S | U | Z | ZZ |
|----------------|----|------|------|----|----|---------|-----|---|----|----|----|----------|------|------|---|----|----|----|----|
| 10 | 15 | 15 | 12 | 17 | 14 | 3.3 | 3.2 | 4 | 8 | 18 | 28 | M4 x 0.7 | 12.5 | 22.5 | 5 | 46 | 8 | 82 | 87 |
| 16 | 15 | 18.3 | 18.3 | 20 | 20 | 5 | 6.5 | 5 | 8 | 23 | 28 | M5 x 0.8 | 12.5 | 27.5 | 8 | 47 | 10 | 85 | 93 |

* Clevis pin and snap ring are shipped together.

Accessory Dimensions

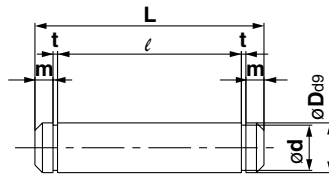
Single Knuckle Joint



Material: Stainless steel 304

| Part no. | Applicable bore size (mm) | A1 | L1 | MM | NDH10 | NX | R1 | U1 |
|-----------|---------------------------|----|----|----------|------------------------------------|-----|----|----|
| I-J010SUS | 10 | 8 | 21 | M4 x 0.7 | 3.3 ^{+0.048} ₀ | 3.1 | 8 | 9 |
| I-J016SUS | 16 | 8 | 25 | M5 x 0.8 | 5 ^{+0.048} ₀ | 6.4 | 12 | 14 |

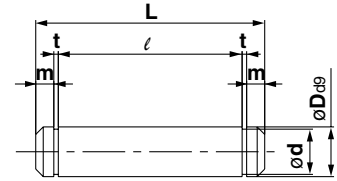
Clevis Pin



Material: Pin and snap ring both stainless steel 304

| Part no. | Applicable bore size (mm) | Dd9 | d | L | ℓ | m | t | Applicable snap ring |
|------------|---------------------------|---|-----|------|------|-----|-----|----------------------|
| CD-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| CD-Z015SUS | 16 | 5 ^{-0.030} _{-0.060} | 4.8 | 22.7 | 18.3 | 1.5 | 0.7 | Type C 5 |

Knuckle Pin



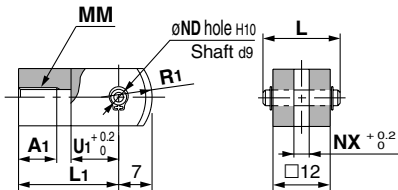
Material: Pin and snap ring both stainless steel 304

| Part no. | Applicable bore size (mm) | Dd9 | d | L | ℓ | m | t | Applicable snap ring |
|------------|---------------------------|---|-----|------|------|-----|-----|----------------------|
| CD-J010 | 10 | 3.3 ^{-0.030} _{-0.060} | 3 | 15.2 | 12.2 | 1.2 | 0.3 | Type C 3.2 |
| IY-J015SUS | 16 | 5 ^{-0.030} _{-0.060} | 4.8 | 16.6 | 12.2 | 1.5 | 0.7 | Type C 5 |

* Clevis pin is used instead for ø10.

Double Knuckle Joint

* Knuckle pin and snap ring are packaged together.

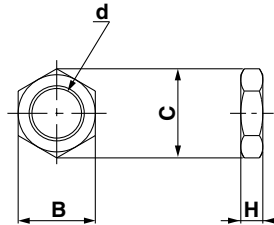


Material: Stainless steel 304

| Part no. | Applicable bore size (mm) | A1 | L | L1 | MM | NDd9 |
|-----------|---------------------------|----|------|----|----------|---|
| Y-J010SUS | 10 | 8 | 15.2 | 21 | M4 x 0.7 | 3.3 ^{-0.030} _{-0.060} |
| Y-J016SUS | 16 | 11 | 16.6 | 21 | M5 x 0.8 | 5 ^{-0.030} _{-0.060} |

| Part no. | NDH10 | NX | R1 | U1 |
|-----------|------------------------------------|-----|----|----|
| Y-J010SUS | 3.3 ^{+0.048} ₀ | 3.2 | 8 | 10 |
| Y-J016SUS | 5 ^{+0.048} ₀ | 6.5 | 12 | 10 |

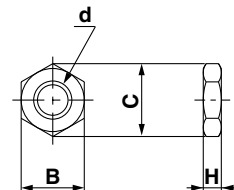
Mounting Nut



Material: Stainless steel 304

| Part no. | Applicable bore size (mm) | B | C | d | H |
|-------------|---------------------------|----|------|-----------|---|
| SNJ-016SUS | 10 | 14 | 16.2 | M10 x 1.0 | 4 |
| SNKJ-016SUS | 16 | 17 | 19.6 | M12 x 1.0 | 4 |

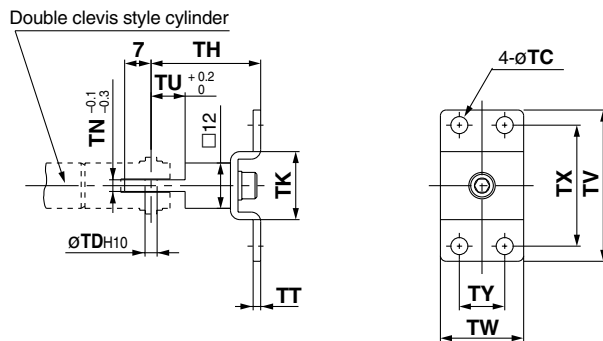
Rod End Nut



Material: Stainless steel 304

| Part no. | Applicable bore size (mm) | B | C | d | H |
|------------|---------------------------|---|-----|----------|-----|
| NTJ-010SUS | 10 | 7 | 8.1 | M4 x 0.7 | 3.2 |
| NTJ-015SUS | 16 | 8 | 9.2 | M5 x 0.8 | 4 |

T-bracket

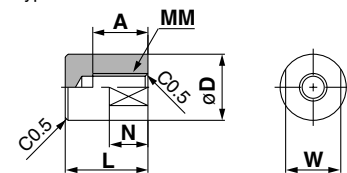


Material: Stainless steel 304

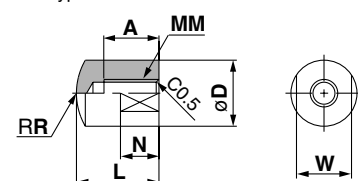
| Part no. | Applicable bore size (mm) | TC | TDH10 | TH | TK | TN | TT | TU | TV | TW | TX | TY |
|------------|---------------------------|-----|------------------------------------|----|----|-----|-----|----|----|----|----|----|
| CJ-T010SUS | 10 | 4.5 | 3.3 ^{+0.048} ₀ | 29 | 18 | 3.1 | 2 | 9 | 40 | 22 | 32 | 12 |
| CJ-T016SUS | 16 | 5.5 | 5 ^{+0.048} ₀ | 35 | 20 | 6.4 | 2.5 | 14 | 48 | 28 | 38 | 16 |

Rod End Cap

Flat type/CJ-CF□□□



Round type/CJ-CR□□□

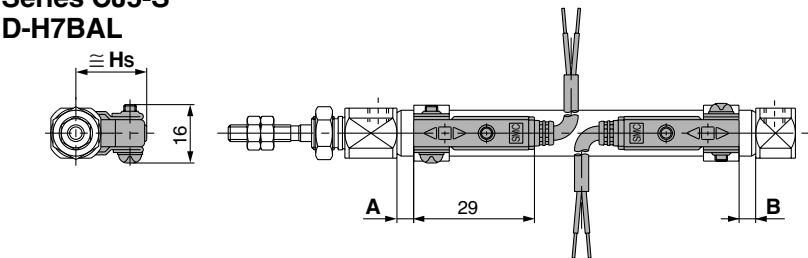


Material: Polyacetal

| Part no. | | Applicable bore size (mm) | A | D | L | MM | N | R | W |
|-----------|------------|---------------------------------|----|----|----|----------|---|----|----|
| Flat type | Round type | | | | | | | | |
| CJ-CF010 | CJ-CR010 | 10 | 8 | 10 | 13 | M4 x 0.7 | 6 | 10 | 8 |
| CJ-CF016 | CJ-CR016 | 16 | 10 | 12 | 15 | M5 x 0.8 | 7 | 12 | 10 |

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

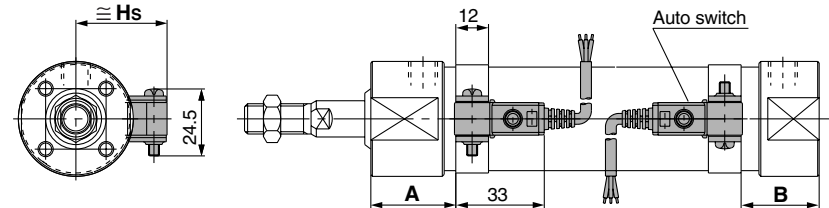
Series CJ5-S
D-H7BAL



Minimum Stroke for Auto Switch Mounting

| Mounting bracket | Basic style, Foot style, Flange style, Clevis style | | |
|-------------------------|---|------------------------|------------------|
| Number of auto switches | 1 (Rod cover side) | 2 (Different sides) | 2 (Same side) |
| Switch mounting side | Port side | Port side | Port side |
| Switch type | | | |
| Minimum stroke (mm) | 10 | 15 | 60 |

Series CG5-S
D-G5BAL



Minimum Stroke for Auto Switch Mounting

| Mounting bracket | Basic style, Foot style, Flange style, Clevis style | | |
|-------------------------|---|------------------------|------------------|
| Number of auto switches | 1 (Rod cover side) | 2 (Different sides) | 2 (Same side) |
| Switch mounting side | Port side | Port side | Port side |
| Switch type | | | |
| Minimum stroke (mm) | 10 | 15 | 75 |

Operating Range

| Auto switch model | Bore size (mm) | |
|-------------------|----------------|----|
| | 10 | 16 |
| D-H7BAL | 5 | 5 |

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately $\pm 30\%$ dispersion) There may be the case to change substantially depending on an ambient environment.

Proper Auto Switch Mounting Position and Its Mounting Height

| Applicable bore size (mm) | Auto switch model | D-H7BAL | | |
|---------------------------|-------------------|---------|-----|------|
| | | A | B | Hs |
| 10 | | 0 | 0 | 17 |
| 16 | | 0.5 | 0.5 | 20.5 |

Operating Range

| Auto switch model | Bore size (mm) | | | | | | | |
|-------------------|----------------|----|-----|----|----|-----|-----|-----|
| | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| D-G5BAL | 5 | 5 | 5.5 | 6 | 7 | 7.5 | 7.5 | 8 |

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately $\pm 30\%$ dispersion) There may be the case to change substantially depending on an ambient environment.

Proper Auto Switch Mounting Position and Its Mounting Height

| Applicable bore size (mm) | Auto switch model | D-G5BAL | | |
|---------------------------|-------------------|---------|----|------|
| | | A | B | Hs |
| 20 | | 31.5 | 24 | 26 |
| 25 | | 31.5 | 24 | 28.5 |
| 32 | | 32.5 | 25 | 33 |
| 40 | | 37 | 28 | 36.5 |
| 50 | | 45.5 | 36 | 42 |
| 63 | | 45.5 | 36 | 48.5 |
| 80 | | 56 | 46 | 57.5 |
| 100 | | 57 | 46 | 68 |

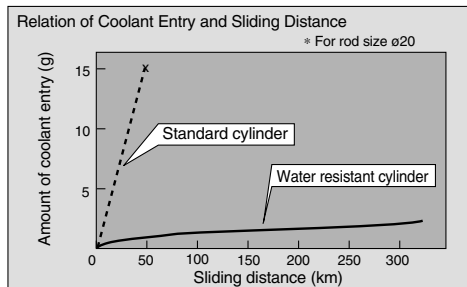
Related Products:

Water Resistant Air Cylinders

■ Applicable for use in an environment with water splashing such as food processing and car wash equipment, etc.

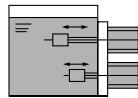
■ Special scraper

- Dramatically improved water resistance compared to standard cylinders



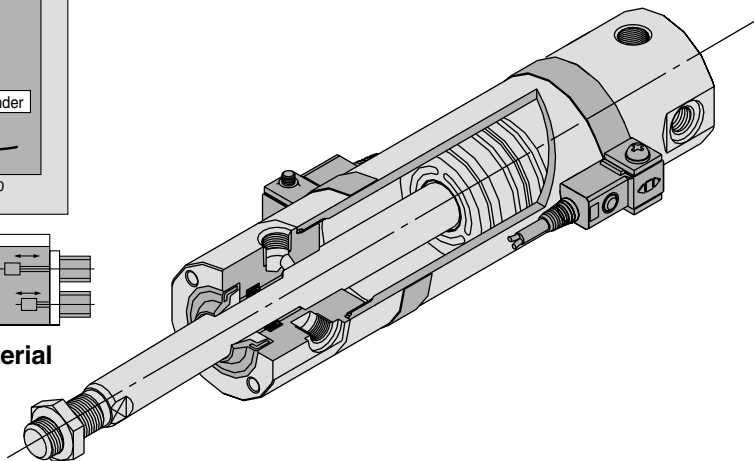
Conditions

Working fluid Air
Pressure 0.5 MPa
Coolant Water-soluble
Piston speed 200 mm/sec (60 cpm)



- Two types of standard seal material

Nitrile rubbers (NBR)
Fluoro rubbers (FKM)



Specifications

| | |
|----------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Cushion | Rubber bumper |
| Auto switch mounting | Band mounting style |
| Made to order | Piston rod/Rod end nut material: Stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

How to Order

| | | | | | | |
|------|------------------------------------|-----------|----------|--------|-------|---|
| CDM2 | Mounting | Bore size | R | Stroke | H7BAL | -XC6 |
| | With auto switch (Built-in magnet) | | | | | Made to order specifications |
| | | | | | | Water resistant 2-color indication solid state switch |
| | | | | | | Water resistant cylinder |
| | | | R | | | NBR seals (Nitrile rubber) |
| | | | V | | | FKM seals (Fluoro rubber) |



Specifications

| | |
|----------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 32, 40, 50, 63, 80, 100 |
| Cushion | Rubber bumper/Air cushion |
| Auto switch mounting | Band mounting style |
| Made to order | Piston rod/Rod end nut material: Stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

How to Order

| | | | | | | | |
|------|------------------------------------|------|-----------|----------|--------|-------|---|
| CDG1 | Mounting | Type | Bore size | R | Stroke | G5BAL | -XC6 |
| | With auto switch (Built-in magnet) | | | | | | Made to order specifications |
| | | | | | | | Water resistant 2-color indication solid state switch |
| | | | | | | | Water resistant cylinder |
| | | | | R | | | NBR seals (Nitrile rubber) |
| | | | | V | | | FKM seals (Fluoro rubber) |

Related Products: Water Resistant Air Cylinders

Compact Cylinder

Series **CQ2** ø20 to ø100

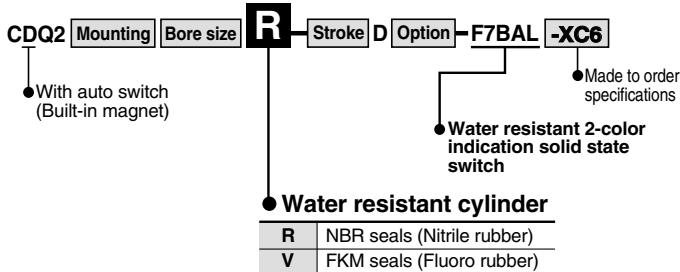


Specifications

| | |
|----------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40, 50, 63, 80, 100 |
| Cushion | None |
| Auto switch mounting | Rail mounting style |
| Made to order | Piston rod/Rod end nut material: Stainless steel (-XC6) |

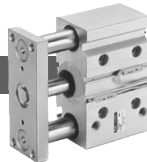
* Specifications other than above are the same as standard, basic style.

How to Order



Compact Guide Cylinder

Series **MGP** ø20 to ø100

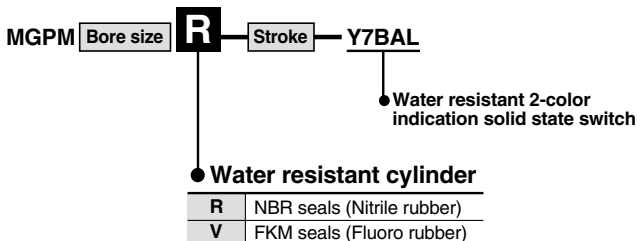


Specifications

| | |
|----------------------|---------------------------------|
| Action | Double acting |
| Bore size (mm) | 20, 25, 32, 40, 50, 63, 80, 100 |
| Bearing type | Slide bearing |
| Cushion | Rubber bumper |
| Auto switch mounting | Direct mount type |

* Specifications other than above are the same as standard, basic style.

How to Order



* Use of stainless steel as the piston rod material will be treated as a special order.

* The Series CA1 has been changed to the Series CA2.

Series **CA1** ø40 to ø100

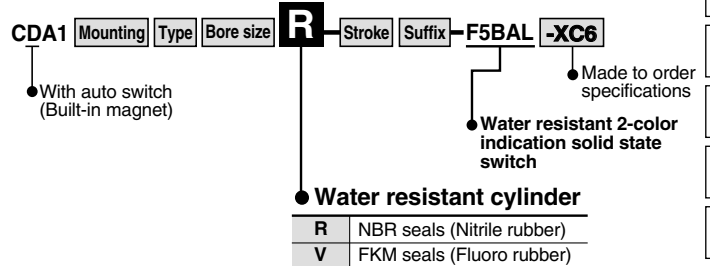


Specifications

| | |
|----------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 40, 50, 63, 80, 100 |
| Cushion | Air cushion |
| Auto switch mounting | Tie-rod mounting style |
| Made to order | Piston rod/Rod end nut material: Stainless steel (-XC6) |

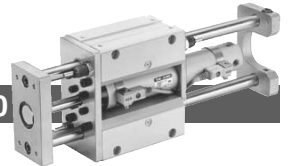
* Specifications other than above are the same as standard, basic style.
Note 1) Air-hydro type, rod boot specifications of Series CA1 are excluded.
Note 2) Combination of auto switches and steel tube is not available.

How to Order



Guide Cylinder

Series **MGG** ø32 to ø50

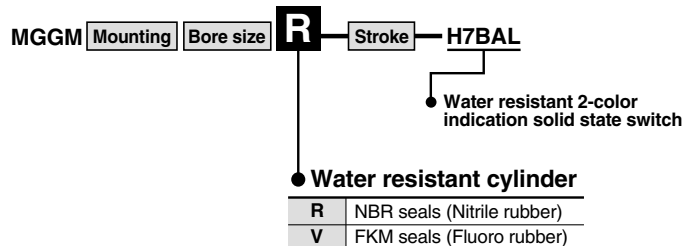


Specifications

| | |
|----------------------|--|
| Action | Double acting |
| Bore size (mm) | 32, 40, 50 |
| Bearing type | Slide bearing |
| Cushion | Rubber bumper, Built-in shock absorber |
| Auto switch mounting | Band mounting style |

* Specifications other than above are the same as standard, basic style.
Note) RBL (coolant resistant) type shock absorber is used.

How to Order



* Use of stainless steel as the piston rod material will be treated as a special order.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C₆5-S

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Related Products:

Products for Piping



Speed controller with One-touch fittings: Stainless series
Series AS-FG/ASD-FG



For details, refer to "Best Pneumatics Vol. 15".



One-touch fittings: Stainless series

Series KG



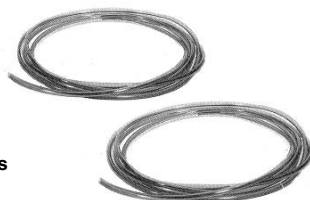
For details, refer to "Best Pneumatics Vol. 15".



Miniature fitting
Series MS



For details, refer to "Best Pneumatics Vol. 15".



Tubing
Series T/TU



For details, refer to "Best Pneumatics Vol. 15".



Floating joint:
Stainless steel type
Series JS



For details, refer to "Best Pneumatics Vol. 10".



Pin Cylinder Series CJP

Double Acting/Single Acting, Spring Return

Series Variations

| Series | Action | Standard variations Built-in magnet | Bore size (mm) | Cylinder standard stroke (mm) | Page |
|--------------------------------|--------------------------|--|----------------|---|--------|
| Standard Series CJP | Double acting (Non-lube) | Single rod | 6 | ø6 — 5, 10, 15, 20 ø10, 15 — 5, 10, 15, 20, (25), 30 | 6-2-8 |
| | Single acting (Non-lube) | Single rod Spring return | 10 15 | 5, 10, 15 | 6-2-14 |

How to Order/Double Acting

| Standard stroke (mm) | | Rod end thread | |
|----------------------|-------------------------|----------------|----------------|
| ø6 | 5, 10, 15, 20 | Nil | With thread |
| ø10, ø15 | 5, 10, 15, 20, (25), 30 | B | Without thread |

| | | | | | | |
|---------------------|------|---|----|----|---|------|
| Without auto switch | CJP | F | 10 | 15 | D | |
| With auto switch | CDJP | F | 10 | 15 | D | 97 S |

| Mounting style | | | | Bore size | |
|----------------|----------------|---------------|------------------|-----------|-------|
| Symbol | Mounting style | Standard type | With auto switch | 6 | 10 |
| B | Basic style | ● | ● | 6 mm | 10 mm |
| F | Flange style | ● | ● | | |
| L | Foot style | ● | ● | | |
| D | Clevis style | ● | — | | |
| T | Trunnion style | ● | — | | |

| Number of auto switches | |
|-------------------------|--------|
| Nil | 2 pcs. |
| S | 1 pc. |

* 5 stroke: S type only

| Auto switch | |
|-------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |

* For the applicable auto switch model, refer to the table below.
* Auto switch is shipped together with the cylinder, (but not assembled).

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length (m)* | | | Pre-wire connector | Applicable load | |
|-------------|------------------|------------------|-----------------|-----------------|--------------|------|-------------------|---------|-----------------------|-------|-------|--------------------|-----------------|------------|
| | | | | | DC | AC | Auto switch model | | 0.5 (Nil) | 3 (L) | 5 (Z) | | | |
| | | | | | | | Perpendicular | In-line | | | | | | |
| Reed switch | — | Grommet | Yes | 2-wire | 24 V | 12 V | — | 97 | ● | ● | ● | — | — | Relay, PLC |
| | | | | | | | 100 V | 93A | ● | ● | ● | — | — | |

* Auto switch cannot be mounted on the clevis style or trunnion style.

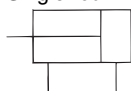
* Lead wire length symbols: 0.5 m.....Nil (Example) 93A
3 m.....L (Example) 93AL
5 m.....Z (Example) 93AZ

• Since there are other applicable auto switches than listed, refer to page 6-2-9 for details.

Pin Cylinder Double Acting, Single Rod Series *CJP* ø6, ø10, ø15



JIS Symbol
Double acting,
Single rod

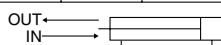


Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|------------------------------------|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB7 | Cold resistant cylinder |
| -XB9 | Low speed cylinder (10 to 50 mm/s) |
| -XC19 | Intermediate stroke (Spacer type) |
| -XC22 | Fluoro rubber seals |

Theoretical Output (N)

| Bore size (mm) | Operating direction | Operating pressure (MPa) | | |
|----------------|---------------------|--------------------------|------|------|
| | | 0.3 | 0.5 | 0.7 |
| 6 | IN | 6.36 | 10.6 | 14.8 |
| | OUT | 8.48 | 14.1 | 19.8 |
| 10 | IN | 17.7 | 29.4 | 41.2 |
| | OUT | 23.6 | 39.3 | 55.0 |
| 15 | IN | 44.5 | 74.2 | 104 |
| | OUT | 53.0 | 88.3 | 124 |



Specifications

| | | |
|-------------------------------|---|----------|
| Action | Double acting, Single rod | |
| Max. operating pressure | 0.7 MPa | |
| Min. operating pressure | ø6 | 0.12 MPa |
| | ø10, ø15 | 0.06 MPa |
| Proof pressure | 1.05 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Lubrication | Not required (Non-lube) | |
| Stroke length tolerance | +1.0 0 | |
| Thread tolerance | JIS Class 2 | |
| Rod end configuration | With thread/Without thread | |
| Piston speed | 50 to 500 mm/s | |
| Cushion | Rubber bumper | |
| Mounting | Basic style, Flange style, Foot style, Clevis style, Trunnion style | |

Standard Equipment Accessory

| Accessory | Mounting nut (1) | Rod end nut (2) | Trunnion (With pin) |
|----------------|------------------|-----------------|---------------------|
| Basic style | ● | ● | — |
| Flange style | ● | ● | — |
| Foot style | ● | ● | — |
| Clevis style | — | ● | — |
| Trunnion style | — | ● | ● |

Standard Stroke

| Bore size (mm) | Stroke (mm) |
|----------------|--------------------------|
| 6 | 5, 10, 15, 20 |
| 10 | 5, 10, 15, 20, (25)*, 30 |
| 15 | 5, 10, 15, 20, (25)*, 30 |

* 5 mm spacer is installed in the 30 mm stroke cylinder.

Option

| Bore size (mm) | 6 | 10 | 15 |
|---------------------------------|--------------------------|--------|--------|
| Auto switch | D-90, D-97, D-90A, D-93A | | |
| Single knuckle joint | I-P006 | I-P010 | I-P015 |
| Double knuckle joint (With pin) | Y-P006 | Y-P010 | Y-P015 |

* 5 mm stroke is with one switch.

Auto switch cannot be mounted on the clevis style or trunnion style.

Mounting Bracket Part No.

| Bore size (mm) | 6 | 10 | 15 |
|---------------------------|---------|---------|---------|
| Mounting | | | |
| Flange style | CP-F006 | CP-F010 | CP-F015 |
| Foot style | CP-L006 | CP-L010 | CP-L015 |
| Trunnion style (With pin) | CP-T006 | CP-T010 | CP-T015 |

Auto Switch Mounting Bracket Part No.

| Auto switch model | Mounting bracket part no. | Applicable bore size (mm) |
|----------------------|---------------------------|---------------------------|
| D-90/97 D-90A/93A | BP-1 | 6, 10, 15 |

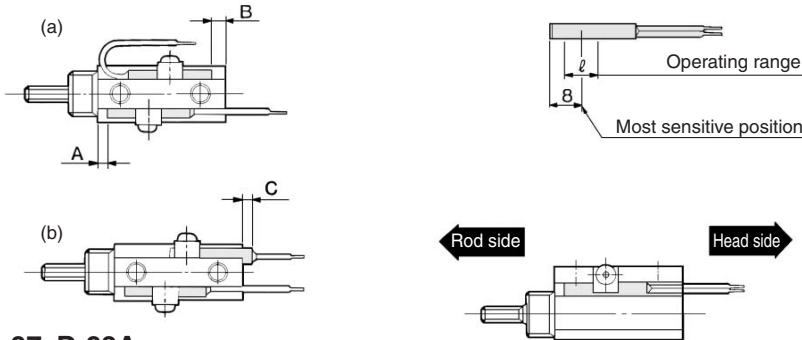
Weight/Cylinder (g)

| | Stroke Mounting | Bore size (mm) | | |
|--------------|---------------------|----------------|----|-----|
| | | 6 | 10 | 15 |
| Basic weight | 5 | 44 | 60 | 99 |
| | 10 | 50 | 66 | 108 |
| | 15 | 56 | 73 | 118 |
| | 20 | 62 | 79 | 127 |
| | (25) | — | 93 | 148 |
| Bracket | 30 | — | 92 | 146 |
| | Flange style | 5 | 6 | 16 |
| | Foot style | 8 | 10 | 24 |
| | Clevis style | 3 | 7 | 12 |
| | Trunnion (With pin) | 18 | 32 | 80 |

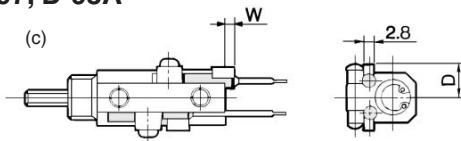
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-90, D-90A

Most sensitive position and operating range of auto switch



D-97, D-93A



| Bore size (mm) | A dimension | | B dimension | | | C dimension | | W dimension | | D |
|-------------------|--------------------|---------|-------------|-----------------|---------|--------------------|---------|--------------------|---------|-----|
| | 5, 10, 15, 20 (st) | 30 (st) | 5 (st) | 10, 15, 20 (st) | 30 (st) | 5, 10, 15, 20 (st) | 30 (st) | 5, 10, 15, 20 (st) | 30 (st) | |
| 6 | 3.5 | — | — | 5 | — | 1.5 | — | 7.5 | — | 9.5 |
| 10 | 2.5 | — | — | 4 | — | 3 | — | 9 | — | 10 |
| 15 | 2 | — | — | 3.5 | — | 3.5 | — | 9.5 | — | 11 |

Note 1) For 5 stroke cylinders, only one auto switch may be mounted either at the stroke end of the rod side or head side. Also, for the auto switch mounting position of the rod side for 25 stroke cylinders, it will be A dimension + 5 mm.

Note 2) There are two ways to mount the auto switches as shown in the above figure. For the b, c, method, the auto switch in the head side will extend slightly past the edge.

Precautions

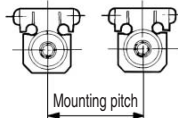
Before handling auto switches, refer to page 6-16-1 for Auto Switches.

Caution

1. If auto switch cylinders are used in parallel keep the distance between cylinders in accordance with the chart below.

| Bore size (mm) | 6 | 10 | 15 |
|---------------------|----------|-----------|-----------|
| Mounting pitch (mm) | 20 | 30 | 35 |

Use caution not to use them, getting closer than the specified pitch. Otherwise, it may cause auto switch to malfunction.



Operating Range

| Auto switch model | Bore size (mm) | | |
|--------------------|----------------|-----------|-----------|
| | 6 | 10 | 15 |
| D-9□, D-9□A | 5.5 | 8 | 9 |

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately $\pm 30\%$ dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

| Type | Model | Electrical entry (Fetching direction) | Features |
|-------------|-------|--|--|
| Reed switch | D-90 | Grommet (In-line) | Without indicator light, Parallel cord |
| | D-90A | Grommet (In-line) | Without indicator light, Cable cord |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

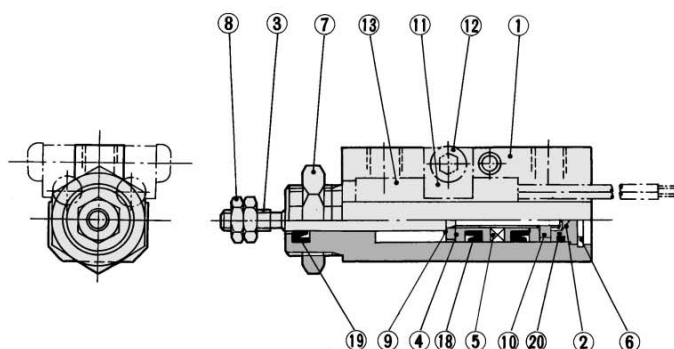
-X

20-

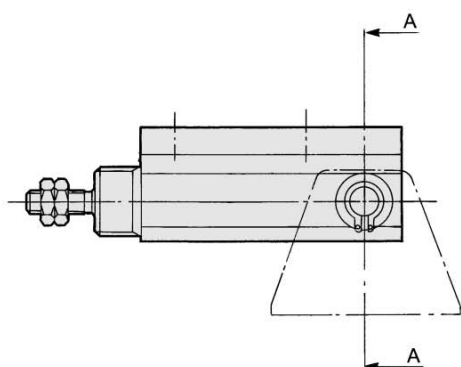
Data

Construction

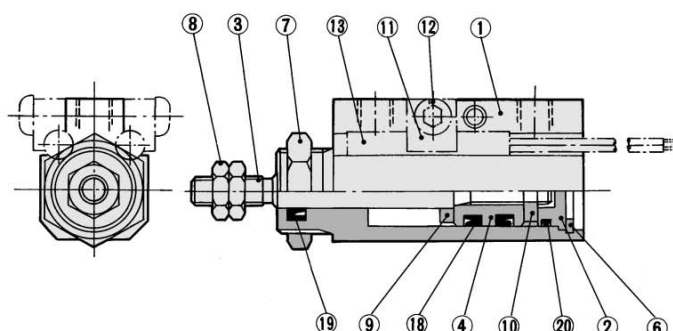
C□JPB6



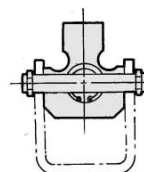
CJP_D6 to 15 (Construction is the same as CJPB 6 to 15.)



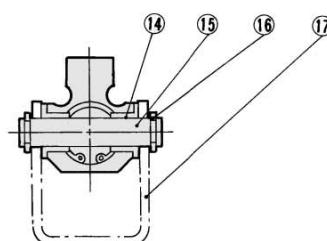
C□JPB10 C□JPB15



ø6



ø10, ø15



Section A-A

Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|-------------------|--|
| ① | Body | Brass | Electroless nickel plated |
| ② | Head cover | Brass | Electroless nickel plated |
| ③ | Piston rod | Stainless steel | |
| ④ | Piston | ø6 | Brass |
| | | ø10, ø15 | Brass |
| ⑤ | Magnet | Magnetic material | With auto switch only |
| ⑥ | Snap ring | Carbon tool steel | Black zinc chromated |
| ⑦ | Mounting nut | Brass | Electroless nickel plated |
| ⑧ | Rod end nut | Carbon steel | Nickel plated |
| ⑨ | Bumper A | Urethane | |
| ⑩ | Bumper B | Urethane | |
| ⑪ | Switch mounting bracket | Aluminum alloy | Black anodized |
| ⑫ | Switch mounting screw | Steel | Black zinc chromated |
| ⑬ | Auto switch | — | D-90, D-97, D-90A, D-93A |
| ⑭ | Flange bushing | Resin | The 6 mm bore cylinder is not available. |
| ⑮ | Trunnion pin | Stainless steel | Only used for trunnion style mounting |
| ⑯ | Snap ring | Carbon tool steel | Black zinc chromated |
| ⑰ | Trunnion pin | Carbon steel | Black zinc chromated |
| ⑱ | Piston seal | NBR | |
| ⑲ | Rod seal | NBR | |
| ⑳ | Gasket | NBR | |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Snap Ring Installation/Removal

⚠ Caution

1. To replace seals or grease the cylinder during maintenance, use an appropriate pair of pliers (tool for installing a type C snap ring for hole). After re-installing the cylinder, make sure that the snap ring is placed securely in the groove before supplying air.
2. To remove and install the snap ring for the knuckle pin or the clevis pin, use an appropriate pair of pliers (tool for installing a type C snap ring for hole). In particular, use a pair of ultra-mini pliers, for removing and installing the snap rings on the ø6 cylinder.

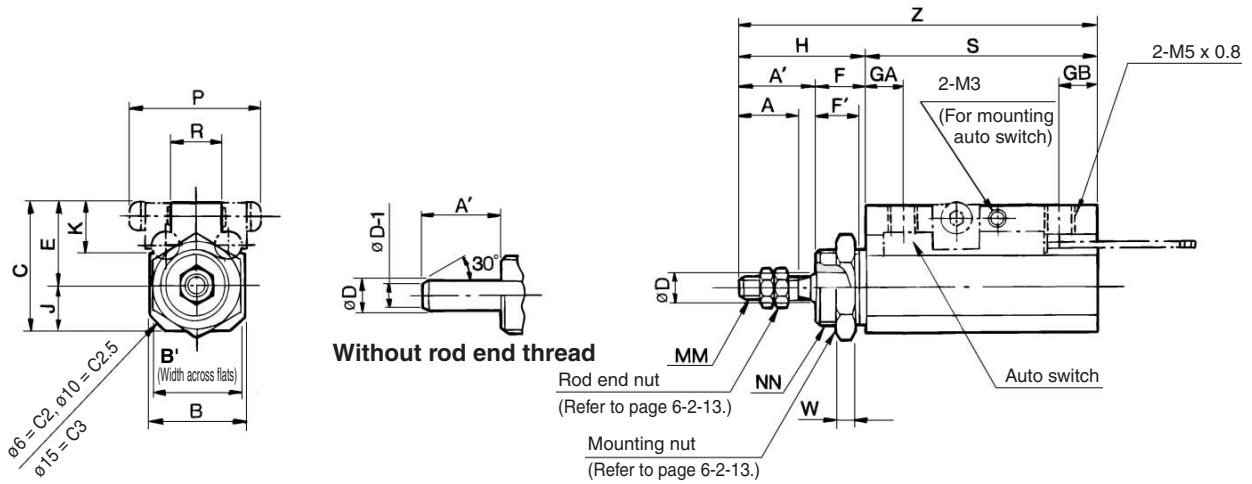
Replacement Parts: Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|------------------------------|
| 6 | CJPB6D-PS | Set of nos. above ⑱, ⑲, ⑳ |
| 10 | CJPB10D-PS | |
| 15 | CJPB15D-PS | |

* No. ⑱, ⑲ and ⑳ are one seal kit. Please order a seal kit with each part number of tube bore size.

Basic Style

C□JPB

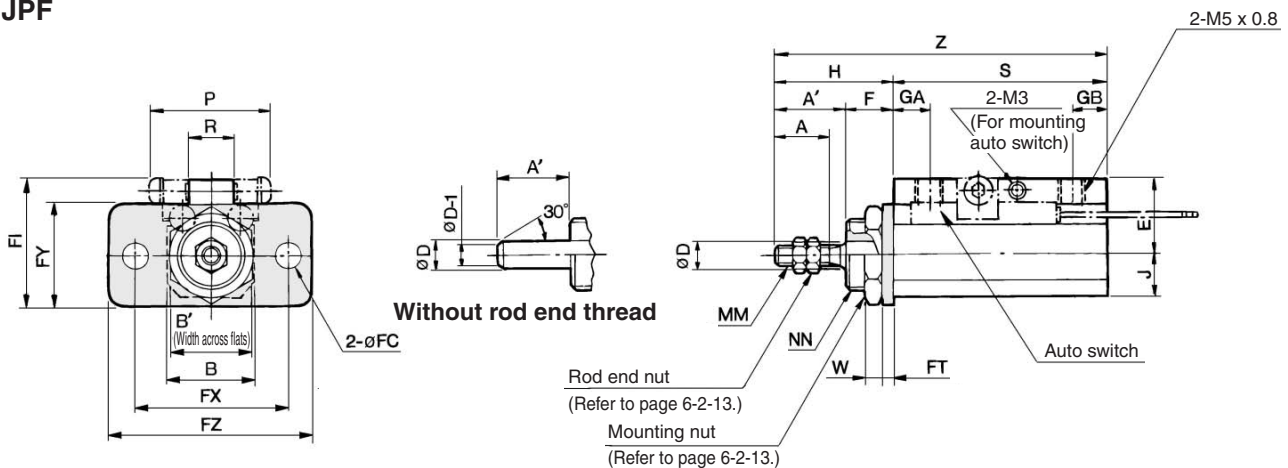


| Bore size (mm) | Symbol | A | A' | B | B' | D | F | F' | GA | GB | H | J | K | MM | NN | R | S | | | | |
|----------------|--------|----|----|----|----|---|----|-----|----|----|----|---|---|----------|-----------|----|------|-------|-------|-------|-------|
| | | | | | | | | | | | | | | | | | 5 st | 10 st | 15 st | 20 st | 30 st |
| 6 | | 7 | 9 | 14 | 14 | 3 | 8 | 6.5 | 6 | 6 | 17 | 6 | 8 | M3 x 0.5 | M10 x 1.0 | 7 | 30.5 | 35.5 | 40.5 | 45.5 | — |
| 10 | | 10 | 12 | 15 | 17 | 5 | 8 | 6.5 | 6 | 7 | 20 | 7 | 8 | M4 x 0.7 | M12 x 1.0 | 8 | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 |
| 15 | | 12 | 14 | 20 | 19 | 6 | 10 | 8.5 | 6 | 7 | 24 | 9 | 8 | M5 x 0.8 | M14 x 1.0 | 10 | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 |

| Bore size (mm) | Symbol | W | Z | | | | | With auto switch | | |
|----------------|--------|---|------|-------|-------|-------|-------|------------------|------|----|
| | | | 5 st | 10 st | 15 st | 20 st | 30 st | C | E | P |
| 6 | | 3 | 47.5 | 52.5 | 57.5 | 62.5 | — | 16.5 | 10.5 | 20 |
| 10 | | 3 | 50.5 | 55.5 | 60.5 | 65.5 | 75.5 | 20 | 13 | 21 |
| 15 | | 4 | 54.5 | 59.5 | 64.5 | 69.5 | 79.5 | 24.5 | 15.5 | 23 |

Flange Style

C□JPF



| Bore size (mm) | Symbol | A | A' | B | B' | D | E | F | GA | GB | H | J | MM | NN | R | FC | FT | FX | FY | FZ |
|----------------|--------|----|----|----|----|---|------|----|----|----|----|---|----------|-----------|----|-----|-----|----|----|----|
| | | | | | | | | | | | | | | | | | | | | |
| 6 | | 7 | 9 | 14 | 14 | 3 | 10.5 | 8 | 6 | 6 | 17 | 6 | M3 x 0.5 | M10 x 1.0 | 7 | 3.4 | 1.6 | 24 | 16 | 32 |
| 10 | | 10 | 12 | 15 | 17 | 5 | 13 | 8 | 6 | 7 | 20 | 7 | M4 x 0.7 | M12 x 1.0 | 8 | 4.5 | 1.6 | 28 | 18 | 37 |
| 15 | | 12 | 14 | 20 | 19 | 6 | 15.5 | 10 | 6 | 7 | 24 | 9 | M5 x 0.8 | M14 x 1.0 | 10 | 5.5 | 2.3 | 36 | 22 | 49 |

| Bore size (mm) | Symbol | S | | | | | W | Z | | | | | With auto switch | |
|----------------|--------|------|-------|-------|-------|-------|---|------|-------|-------|-------|-------|------------------|------|
| | | 5 st | 10 st | 15 st | 20 st | 30 st | | 5 st | 10 st | 15 st | 20 st | 30 st | P | FI |
| 6 | | 30.5 | 35.5 | 40.5 | 45.5 | — | 3 | 47.5 | 52.5 | 57.5 | 62.5 | — | 20 | 18.5 |
| 10 | | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 | 3 | 50.5 | 55.5 | 60.5 | 65.5 | 75.5 | 21 | 22 |
| 15 | | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 | 4 | 54.5 | 59.5 | 64.5 | 69.5 | 79.5 | 23 | 26.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

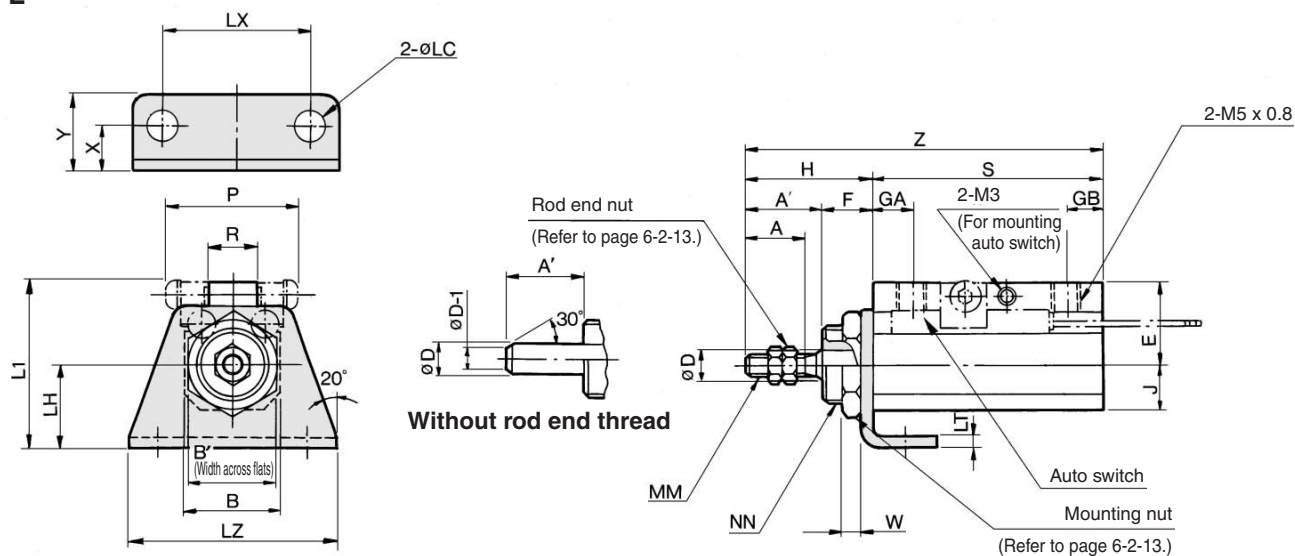
20-

Data

Series CJP

Foot Style

C□JPL

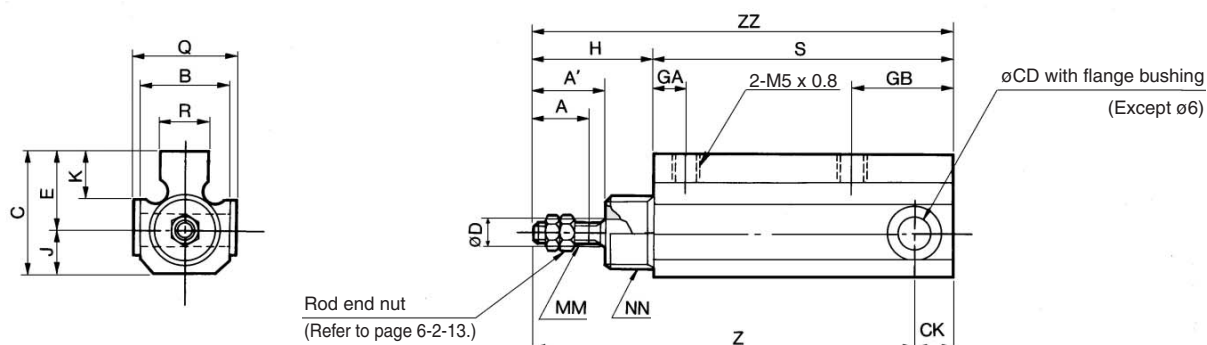


| Bore size (mm) \ Symbol | A | A' | B | B' | D | E | F | GA | GB | H | MM | NN | R | X | Y | LC | LH | LT | LX | LZ |
|-------------------------|----|----|----|----|---|------|----|----|----|----|----------|-----------|----|-----|------|-----|----|-----|----|----|
| 6 | 7 | 9 | 14 | 14 | 3 | 10.5 | 8 | 6 | 6 | 17 | M3 x 0.5 | M10 x 1.0 | 7 | 6.5 | 10.5 | 3.4 | 11 | 1.6 | 20 | 28 |
| 10 | 10 | 12 | 15 | 17 | 5 | 13 | 8 | 6 | 7 | 20 | M4 x 0.7 | M12 x 1.0 | 8 | 7 | 12 | 4.5 | 13 | 1.6 | 24 | 33 |
| 15 | 12 | 14 | 20 | 19 | 6 | 15.5 | 10 | 6 | 7 | 24 | M5 x 0.8 | M14 x 1.0 | 10 | 10 | 16.5 | 5.5 | 18 | 2.3 | 30 | 43 |

| Bore size (mm) \ Symbol | S | | | | | W | Z | | | | | J | With auto switch | |
|-------------------------|------|-------|-------|-------|-------|---|------|-------|-------|-------|-------|---|------------------|------|
| | 5 st | 10 st | 15 st | 20 st | 30 st | | 5 st | 10 st | 15 st | 20 st | 30 st | | P | L1 |
| 6 | 30.5 | 35.5 | 40.5 | 45.5 | — | 3 | 47.5 | 52.5 | 57.5 | 62.5 | — | 6 | 20 | 21.5 |
| 10 | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 | 3 | 50.5 | 55.5 | 60.5 | 65.5 | 75.5 | 7 | 21 | 26 |
| 15 | 30.5 | 35.5 | 40.5 | 45.5 | 55.5 | 4 | 54.5 | 59.5 | 64.5 | 69.5 | 79.5 | 9 | 23 | 33.5 |

Clevis Style

CJPD/Without auto switch



| Bore size (mm) \ Symbol | A | A' | B | C | D | E | GA | GB | H | J | K | MM | NN | Q | R | CD | CK |
|-------------------------|----|----|----|------|---|------|----|------|----|---|---|----------|-----------|----------------------------------|----|----------------------------------|-----|
| 6 | 7 | 9 | 14 | 16.5 | 3 | 10.5 | 6 | 11 | 17 | 6 | 8 | M3 x 0.5 | M10 x 1.0 | — | 7 | 3 ^{+0.040} ₀ | 4 |
| 10 | 10 | 12 | 15 | 20 | 5 | 13 | 6 | 17 | 20 | 7 | 8 | M4 x 0.7 | M12 x 1.0 | 17 ⁻⁰ _{-0.5} | 8 | 5 ^{+0.065} ₀ | 6.5 |
| 15 | 12 | 14 | 20 | 24.5 | 6 | 15.5 | 6 | 18.5 | 24 | 9 | 8 | M5 x 0.8 | M14 x 1.0 | 22 ⁻⁰ _{-0.5} | 10 | 6 ^{+0.065} ₀ | 8 |

| Bore size (mm) \ Symbol | S | | | | | Z | | | | | ZZ | | | | |
|-------------------------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| | 5 st | 10 st | 15 st | 20 st | 30 st | 5 st | 10 st | 15 st | 20 st | 30 st | 5 st | 10 st | 15 st | 20 st | 30 st |
| 6 | 35.5 | 40.5 | 45.5 | 50.5 | — | 48.5 | 53.5 | 58.5 | 63.5 | — | 52.5 | 57.5 | 62.5 | 67.5 | — |
| 10 | 40.5 | 45.5 | 50.5 | 55.5 | 65.5 | 54 | 59 | 64 | 69 | 79 | 60.5 | 65.5 | 70.5 | 75.5 | 85.5 |
| 15 | 42 | 47 | 52 | 57 | 67 | 58 | 63 | 68 | 73 | 83 | 66 | 71 | 76 | 81 | 91 |

Pin Cylinder Single Acting, Single Rod, Single Return *Series CJP* ø6, ø10, ø15

A short stroke miniature cylinder with a shorter overall length.

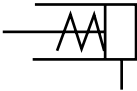
The installation space can be significantly reduced because this cylinder can be recessed directly into a machine body or installed on a panel.
Thus, the machine can be made more compact.



Plug mounting style Panel mounting style

JIS Symbol

Single acting,
Spring return

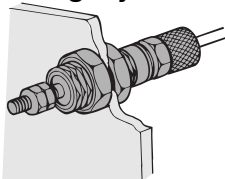


Made to Order Specifications (For details, refer to page 6-17-1.)

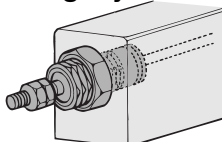
| Symbol | Specifications |
|--------|--------------------------------|
| -XC17 | Pin cylinder with rod quenched |
| -XC22 | Fluoro rubber seals |

Mounting Style

Panel mounting style



Plug mounting style



How to Order

CJP B 10 15 H4

Pin cylinder

Mounting style

| | |
|---|----------------------|
| B | Panel mounting style |
| S | Plug mounting style |

Bore size

| | |
|----|-------|
| 6 | 6 mm |
| 10 | 10 mm |
| 15 | 15 mm |

Rod end thread

| | |
|-----|----------------|
| Nil | With thread |
| B | Without thread |

Hose nipple
(Applicable to panel mounting style only.)
(Hose nipple is not attached to embedded style.)

| | |
|-----|-----------------------|
| H4 | ø4/For ø2.5 tubing |
| H6 | ø6/For ø4 tubing |
| Nil | Without hose nipple * |

* Refer to ⚠ caution on piping on page 6-2-15.

Standard stroke (mm)

| | |
|--------------|-----------|
| ø6, ø10, ø15 | 5, 10, 15 |
|--------------|-----------|

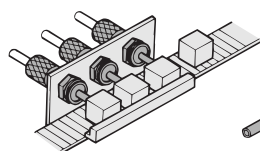
Specifications

| | | | |
|-----------------------------------|--------------------|---------------------------------------|---|
| Action | | Single acting, Spring return | |
| Maximum operating pressure | | 0.7 MPa | |
| Minimum operating pressure | ø6 | 0.2 MPa | |
| | ø10, ø15 | 0.15 MPa | |
| Proof pressure | | 1.05 MPa | |
| Ambient and fluid temperature | | −10 to 70°C (No freezing) | |
| Lubrication | | Not required (Non-lube) | |
| Piston speed | | 50 to 500 mm/s | |
| Cushion | | None | |
| Stroke length tolerance | | +1.0 0 | |
| Thread tolerance | | JIS Class 2 | |
| Rod end configuration | | With thread/Without thread | |
| Mounting bracket | | Panel mounting style | Plug mounting style |
| Accessory (Standard equipment) | Standard equipment | Mounting nut (2) Rod end nut * (2) | Mounting nut (1) Gasket (1) Rod end nut * (2) |
| | Option | Hose nipple | |

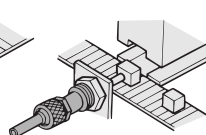
* When rod end is threaded.

Application Example

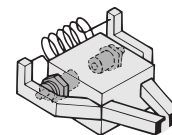
Clamper



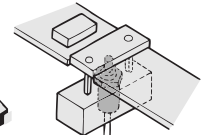
Ejector



Gripper



Stopper



Pin Cylinder Single Acting, Single Return **Series CJP**

Standard Stroke

| Bore size (mm) | Stroke (mm) |
|----------------|-------------|
| 6 | 5, 10, 15 |
| 10 | 5, 10, 15 |
| 15 | 5, 10, 15 |

Spring Reaction Force

| Bore size (mm) | Stroke (mm) | Retracted side | Extended side |
|----------------|-------------|----------------|---------------|
| 6 | 5, 10, 15 | 3.92 | 1.42 |
| 10 | 5, 10, 15 | 5.98 | 2.45 |
| 15 | 5, 10, 15 | 10.8 | 4.41 |

* Same spring force for each stroke.

Weight

(g)

| Model | Stroke (mm) | | |
|---------------|-------------|------|------|
| | 5 | 10 | 15 |
| CJP□6 | 10.6 | 13.1 | 15.6 |
| CJP□10 | 28 | 33 | 38 |
| CJP□15 | 72 | 82 | 92 |

* Weight of hose nipple (4 g) for panel mounting is excluded.

Hose Nipple Dedicated for Panel Mounting Style (With fixed orifice)

| Applicable tubing | Part no. |
|--------------------|----------|
| ø4/For ø2.5 tubing | CJ-5H-4 |
| ø6/For ø4 tubing | CJ-5H-6 |

Theoretical Output

(N)

| Bore size (mm) | Operating direction | Operating pressure (MPa) | | |
|----------------|---------------------|--------------------------|------|------|
| | | 0.3 | 0.5 | 0.7 |
| 6 | OUT | 4.56 | 10.2 | 15.9 |
| | IN | 1.42 | | |
| 10 | OUT | 17.6 | 33.3 | 49.0 |
| | IN | 2.45 | | |
| 15 | OUT | 42.2 | 77.5 | 113 |
| | IN | 4.41 | | |

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Piping

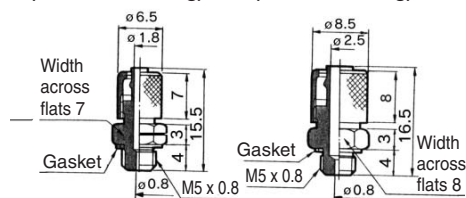
⚠ Caution

1. Use a dedicated hose nipple.
On the panel mounting style, use the CJ-5H-4 or CJ-5H-6, a dedicated hose nipple (with a fixed orifice) that is provided. If a different fitting must be used due to unavoidable circumstances, make sure to install a speed controller and use it by adjusting it to 500 mm/s or less.

Hose nipple

CJ-5H-4
(ø4/For ø2.5 tubing)

CJ-5H-6
(ø6/For ø4 tubing)



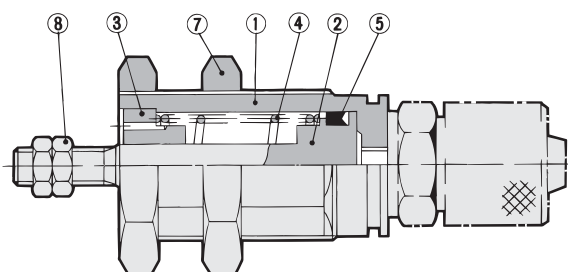
Mounting

⚠ Caution

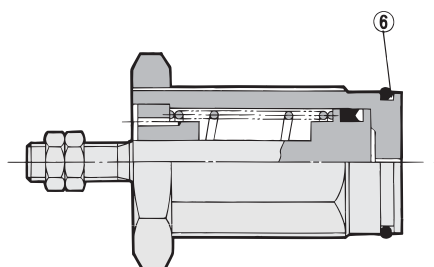
1. Do not use it in such a way that a load could be applied to the piston rod during the retraction.
The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod will not be able to retract to the end of the stroke.

Construction (Not able to disassemble.)

Panel mounting style



Plug mounting style



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|---|
| ① | Cover | Brass | Electroless nickel plated |
| ② | Piston | Stainless steel | |
| ③ | Collar | Oil-impregnated sintered alloy | ø6, ø10 Phosphor bronze |
| ④ | Return spring | Piano wire | Zinc chromated |
| ⑤ | Piston seal | NBR | |
| ⑥ | Gasket | NBR | Special product (O-ring) for embedded style |
| ⑦ | Mounting nut | Brass | Electroless nickel plated |
| ⑧ | Rod end nut | Steel | Nickel plated |

Dedicated Nut Part No.

| Description | Bore size (mm) | 6 | 10 | 15 |
|--------------|----------------|----------|----------|----------|
| Mounting nut | | SNPS-006 | SNPS-010 | SNPS-015 |
| Rod end nut | | NTP-006 | NTP-010 | NTP-015 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

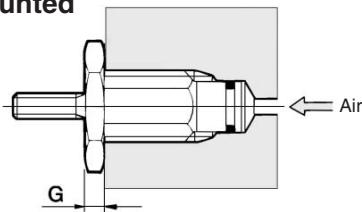
20-

Data

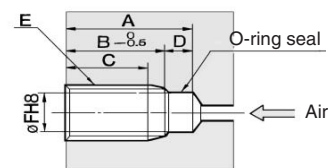
Series CJP

Recommended Mounting Hole Dimensions for Plug Mounting Style

When plug mounted



Machining dimensions
for mounting

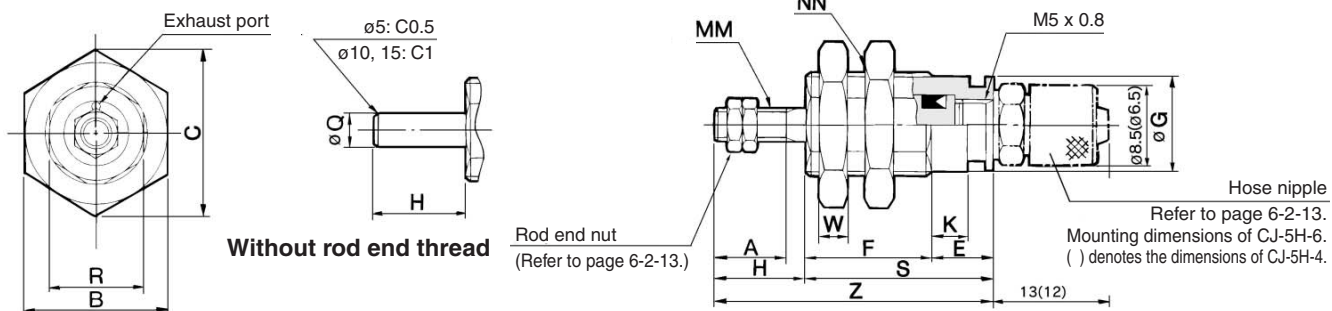


| Bore size (mm) | Stroke | A | B | C | D | E | F | G |
|----------------|--------|------|------|------|-----|-----------|-----|---|
| 6 | 5 | 16 | 12.5 | 10 | 3.5 | M10 x 1.0 | 8.5 | 3 |
| | 10 | 23 | 19.5 | 17 | | | | |
| | 15 | 30 | 26.5 | 24 | | | | |
| 10 | 5 | 17 | 13.5 | 10.5 | 3.5 | M15 x 1.5 | 12 | 4 |
| | 10 | 23.5 | 20 | 17 | | | | |
| | 15 | 30.5 | 27 | 24 | | | | |
| 15 | 5 | 19 | 14.5 | 11.5 | 4.5 | M22 x 1.5 | 19 | 5 |
| | 10 | 25 | 20.5 | 17.5 | | | | |
| | 15 | 31.5 | 27 | 24 | | | | |

Note) E and ϕF should be machined in a concentric manner.

Panel Mounting Style

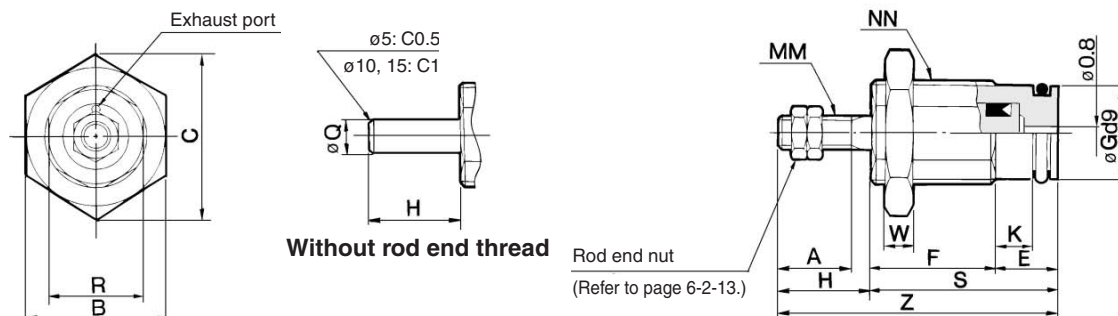
CJPB



| Bore size (mm) | A | B | C | E | F | | | G | H | K | MM | NN | R | S | | | W | Z | | | Q |
|-------------------|----|----|------|---|------|-------|-------|-----|----|-----|----------|-----------|----|------|-------|-------|---|------|-------|-------|---|
| | | | | | 5 st | 10 st | 15 st | | | | | | | 5 st | 10 st | 15 st | | 5 st | 10 st | 15 st | |
| 6 | 7 | 12 | 13.9 | 6 | 12.5 | 19.5 | 26.5 | 8.5 | 9 | 3.5 | M3 x 0.5 | M10 x 1.0 | 9 | 18.5 | 25.5 | 32.5 | 3 | 27.5 | 34.5 | 41.5 | 3 |
| 10 | 10 | 19 | 22 | 6 | 14.5 | 21 | 28 | 12 | 12 | 3.5 | M4 x 0.7 | M15 x 1.5 | 13 | 20.5 | 27 | 34 | 4 | 32.5 | 39 | 46 | 5 |
| 15 | 12 | 27 | 31 | 7 | 16.5 | 22.5 | 29 | 19 | 14 | 4.2 | M5 x 0.8 | M22 x 1.5 | 20 | 23.5 | 29.5 | 36 | 5 | 37.5 | 43.5 | 50 | 6 |

Plug Mounting Style

CJPS



| Bore size (mm) | A | B | C | E | F | | | G | H | K | MM | NN | R | S | | | W | Z | | | Q |
|-------------------|----|----|------|---|------|-------|-------|-----|----|-----|----------|-----------|----|------|-------|-------|---|------|-------|-------|---|
| | | | | | 5 st | 10 st | 15 st | | | | | | | 5 st | 10 st | 15 st | | 5 st | 10 st | 15 st | |
| 6 | 7 | 12 | 13.9 | 6 | 12.5 | 19.5 | 26.5 | 8.5 | 9 | 3.5 | M3 x 0.5 | M10 x 1.0 | 9 | 18.5 | 25.5 | 32.5 | 3 | 27.5 | 34.5 | 41.5 | 3 |
| 10 | 10 | 19 | 22 | 6 | 14.5 | 21 | 28 | 12 | 12 | 3.5 | M4 x 0.7 | M15 x 1.5 | 13 | 20.5 | 27 | 34 | 4 | 32.5 | 39 | 46 | 5 |
| 15 | 12 | 27 | 31 | 7 | 16.5 | 22.5 | 29 | 19 | 14 | 4.2 | M5 x 0.8 | M22 x 1.5 | 20 | 23.5 | 29.5 | 36 | 5 | 37.5 | 43.5 | 50 | 6 |










Air Cylinder

Series CM2

ø20, ø25, ø32, ø40

Series Variations

| Series | Action | Rod | Cushion | Basic | Standard variations | | | | | Bore size (mm) | Page |
|---|---------------|------------|---------|-------|----------------------------|---------------|-----------|--------------|-------------|----------------------|--------|
| | | | | | Built-in One-touch fitting | With rod boot | Air-hydro | Clean series | Copper-free | | |
| Standard Series CM2  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-4 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-25 |
| | | Double rod | Rubber | ● | ● | ● | ● | ● | ● | | 6-4-36 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-53 |
| Non-rotating Rod Series CM2K  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-59 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-64 |
| | | Double rod | Rubber | ● | ● | ● | ● | ● | ● | | 6-4-76 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-81 |
| Single acting Single rod (Spring return/Spring extend) | Single acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-86 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| Direct Mount Series CM2R  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| | | Double rod | Rubber | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| Direct Mount, Non-rotating Rod Series CM2RK  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| Low Friction Series CM2Q  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| Centralized Piping Series CM2□□P  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |
| With End Lock Series CBM2  | Double acting | Single rod | Rubber | ● | ● | ● | ● | ● | ● | 20 25 32 40 | 6-4-91 |
| | | | Air | ● | ● | ● | ● | ● | ● | | 6-4-91 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Air Cylinder

Series CM2

ø20, ø25, ø32, ø40

Longer life, over 1.5 times longer

The cylinder's mounting and the machining accuracy of the parts have been improved. Furthermore, the shapes and the materials of the seals have been improved to enhance their wear resistance. As a result, the cylinder's life has been dramatically increased to 1.5 times that of Series CM.

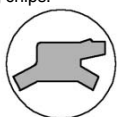
Compact and lightweight

The tube is made of stainless steel and the cover and the piston are made of aluminum. Through a compact design, it weighs 30 to 40% less than Series CM. The lateral width of the cover has been requiring less installation space.



Excellent dust resistance

A special shaped rod seal with a composite formed dust lip has been adopted. It prevents the intrusion of external dust, enabling the cylinder to be operated in unfavorable environments containing large amounts of cutting chips.



Reduced piston rod deflection

The clearance between the bushing and the piston rod, and between the tube and the wear ring have been decreased to achieve higher accuracy. Thus, the deflection of the piston rod has been decreased to 1/2 of Series CM.

A tube that is resistant against external impacts

To prevent deformation or damage caused by external impacts, a stainless tube with a thicker wall has been adopted to increase its strength. Furthermore, the strength of the support bracket has been increased.

Easy installation

Because the rod cover and the head cover have wide surfaces, a wrench can be placed over the cover during installation, thus facilitating installation.

Improved installation accuracy

The cylinder body and the mounting support bracket have been made with an even higher level of accuracy. Improving the installation accuracy simplifies the installation work and prolongs the life of the cylinder.

High speed drive possible

The cushion function can be selected in accordance with the drive speed condition to be used. Therefore, it can support a high-speed drive.

- Rubber bumper.....50 to 750 mm/s (Standard equipment)
- Air cushion.....50 to 1000 mm/s

Replaceable rod seal

The rod seal, which is the first part to wear out in a cylinder, can be replaced. This extends the life of the cylinder, and is economical. The seal can be replaced with the cylinder mounting, thus requiring less manpower.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Air Cylinder: Standard Type Double Acting, Single Rod

Series CM2

ø20, ø25, ø32, ø40

How to Order

Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Type

| | |
|------------|-----------|
| Nil | Pneumatic |
| H | Air-hydro |

Piping

| | |
|------------|-----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fittings |

* Air-hydro cylinder: Screw-in type only

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 6-4-5.

Cushion

| | |
|------------|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

* Air-hydro cylinder: Rubber bumper only

Without auto switch **CM2** **H** **L** **40** **F** — **150** **A** **J**

With auto switch **CDM2** **H** **L** **40** **F** — **150** **A** **J** — **H7BW**

Built-in magnet **Bore size** **Rod boot** **Number of auto switches**

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

| | |
|------------|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | | | | |
|--------------------|--|------------------|-----------------|--------------------------------------|--------------|--------------|-------------------|---|--------------|-----------|----------|--------------------|-----------------|------------|------------|---|---|---|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | | | | |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | | | | | |
| | | | | | | 100 V, 200 V | B54 ** | ● | ● | ● | — | — | | | | | | | |
| | | | | | | — | C73C | ● | ● | ● | — | — | | | | | | | |
| | | | | | | — | A33A ** | — | — | — | ● | — | | | | | | | |
| | 100 V, 200 V | | | | | A34A ** | — | — | — | ● | — | | | | | | | | |
| | DIN terminal | A44A ** | | — | — | — | ● | — | Relay, PLC | | | | | | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | — | — | — | — | — | | — | | | | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | | | | |
| | | 3-wire (PNP) | | 12 V | | H7A2 | ● | ● | ○ | — | ○ | | | | | | | | |
| | | Connector | | 2-wire | | 12 V | H7B | ● | ● | ○ | — | ○ | | | | | | | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | H7C | ● | ● | ● | — | — | | | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 2-wire | | 12 V | G39A ** | — | — | — | ● | — | — | | IC circuit | | | | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | K39A ** | — | — | — | ● | — | — | | | | | | |
| | | | | 3-wire (PNP) | | 5 V, 12 V | H7NW | ● | ● | ○ | — | ○ | IC circuit | | | | | | |
| | | | | Water resistant (2-color indication) | | Grommet | 2-wire | 12 V | H7PW | ● | ● | ○ | — | | ○ | — | | | |
| | | | | | | | | H7BW | ● | ● | ○ | — | ○ | | | | | | |
| | | | | | | | | H7BA | — | — | ○ | — | ○ | | | | | | |
| | | | | | | | | With diagnostic output (2-color indication) | 3-wire (NPN) | 5 V, 12 V | H7NF | ● | ● | | ○ | | — | ○ | IC circuit |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
 ** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

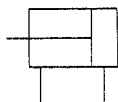
Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**



Clevis integrated

JIS Symbol

Double acting,
Single rod



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB7 | Cold resistant cylinder |
| -XB9 | Low speed cylinder (10 to 50 mm/s) |
| -XB12 | External stainless steel cylinder |
| -XB13 | Low speed cylinder (5 to 50 mm/s) |
| -XC3 | Special port location |
| -XC4 | With heavy duty scraper |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC8 | Adjustable stroke cylinder/Adjustable extension type |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC10 | Dual stroke cylinder/Double rod type |
| -XC11 | Dual stroke cylinder/Single rod type |
| -XC12 | Tandem cylinder |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC20 | Head cover axial port |
| -XC22 | Fluoro rubber seals |
| -XC25 | No fixed orifice of connecting port |
| -XC27 | Double clevis pin and double knuckle pin made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC35 | With coil scraper |
| -XC52 | Mounting nut with set screw |
| -XC58 | Water resistant type/Built-in hard plastic magnet |
| -XC59 | Fluoro rubber seals/Built-in hard plastic magnet |

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Type | Pneumatic | | | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.05 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $^{+1.4}_0$ mm | | | |
| Piston speed | 50 to 750 mm/s | | | |
| Cushion | Rubber bumper | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ^{Note)} | Maximum stroke (mm) |
|----------------|--|---------------------|
| 20 | 25, 50, 75, 100, 125, 150 200, 250, 300 | 1000 |
| 25 | | 1500 |
| 32 | | 2000 |
| 40 | | 2000 |



Note) Other intermediate strokes can be manufactured upon receipt of order.

When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Minimum Stroke for Auto Switch Mounting

(mm)

| Auto switch model | No. of auto switches mounted | | | | |
|--------------------------------------|------------------------------|-----------|--|-------------------|----|
| | 2 | | n | | 1 |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 50 + 45 (n - 2) | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | 60 + 45 (n - 2) | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 65 + 50 (n - 2) | 10 |
| D-B5/B6 D-G5NTL | 15 | 75 | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 75 + 55 (n - 2) | 10 |
| D-B59W | 20 | 75 | $20 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | | 15 |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | 35 + 30 (n - 2) | 100 + 100 (n - 2) | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type)

| ø20 | ø25 | ø32 | ø40 |
|-----|-----|-----|-----|
| ▲13 | ▲13 | ▲13 | ▲16 |

(mm)

Mounting style

- Boss-cut basic style (BZ) ■ Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C |

* Maximum ambient temperature for the rod boot itself.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis (With pin) ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |

* Two foot brackets and a mounting nut are attached.

Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size ø40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. Do not operate with the cushion needle in a fully closed condition.

Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".

3. Do not open the cushion needle wide excessively.

If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.

⚠ Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a snap ring.

When replacing rod seals and removing and mounting a snap ring, use a proper tool (snap ring plier: tool for installing a type C snap ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier. Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

5. Combine the rod end section, so that a rod boot might not be twisted.

If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Mounting Style and Accessory

| Accessory Mounting | Standard equipment | | | Option | | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------|----------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis ⁽⁴⁾ bracket | Rod boot |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — | ● |
| Axial foot style | ● (2) | ● | — | ● | ● | — | ● |
| Rod side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Head side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — | ● |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — | ● |
| Rod side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — | ● |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — | ● |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — | ● |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — | ● |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — | ● |



Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.

Note 2) Mounting nuts are not attached for integral clevis, single clevis, and double clevis styles.

Note 3) Knuckle pin and snap ring (cotter pin for ø40) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis bracket.

Mounting Bracket, Accessory/Material, Surface Treatment

| Segment | Component parts | Material | Surface treatment |
|------------------|--------------------------|---|---|
| Mounting bracket | Foot | Rolled steel plate | Nickel plated |
| | Flange | Rolled steel plate | Nickel plated |
| | Single clevis | Rolled steel | Nickel plated |
| | Double clevis | Rolled steel | Nickel plated |
| | Trunnion | Cast iron | Electroless nickel plated |
| Accessory | Rod end nut | Carbon steel | Nickel plated |
| | Mounting nut | Carbon steel | Nickel plated |
| | Trunnion nut | Carbon steel | Nickel plated |
| | Clevis bracket | Rolled steel plate | Nickel plated |
| | Clevis pin | Carbon steel | (None) |
| | Single knuckle joint | Rolled steel ø40: Sulfur easy chipping steel | Electroless nickel plated |
| | Double knuckle joint | Rolled steel ø40: Cast iron | Electroless nickel plated Metallic bronze collar painted for ø40 |
| | Double clevis pin | Carbon steel | (None) |
| | Double knuckle joint pin | Carbon steel | (None) |

Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.14 | 0.21 | 0.28 | 0.56 |
| | Axial foot style | 0.29 | 0.37 | 0.44 | 0.83 |
| | Flange style | 0.20 | 0.30 | 0.37 | 0.68 |
| | Clevis integrated style | 0.12 | 0.19 | 0.27 | 0.52 |
| | Single clevis style | 0.18 | 0.25 | 0.32 | 0.65 |
| | Double clevis style | 0.19 | 0.27 | 0.33 | 0.69 |
| | Trunnion style | 0.18 | 0.28 | 0.34 | 0.66 |
| | Boss-cut basic style | 0.13 | 0.19 | 0.26 | 0.53 |
| | Boss-cut flange style | 0.19 | 0.28 | 0.35 | 0.65 |
| | Boss-cut trunnion style | 0.17 | 0.26 | 0.32 | 0.63 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |
| Option bracket | Clevis bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2L32-100

- Basic weight.....0.44 (Foot style, ø32)
- Additional weight.....0.08/50 stroke
- Cylinder stroke.....100 stroke

$$0.44 + 0.08 \times 100/50 = 0.60 \text{ kg}$$

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2

Air-hydro

CM2H Mounting style Bore size — Stroke Rod boot

• Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.

Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.



Specifications

| | |
|-------------------------------|--|
| Type | Air-hydro |
| Fluid | Turbine oil |
| Action | Double acting single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Proof pressure | 1.5 MPa |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.18 MPa |
| Piston speed | 15 to 300 mm/s |
| Ambient and fluid temperature | 5 to 60°C |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | +1.4 0 mm |
| Cushion | Rubber bumper (Standard equipment) |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style |

* Auto switch can be mounted. Dimensions are the same as standard type.

- For construction, refer to page 6-4-11.
- Since the dimensions of mounting style is the same as pages 6-4-13 to 6-4-20, refer to those pages.

Built-in One-touch Fittings

CM2 Mounting style Bore size F — Stroke

• Built-in One-touch fittings

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.



- For construction, refer to page 6-4-11.
- For dimensions of each mounting style, refer to pages 6-4-13 to 6-4-20.
- For other specifications, refer to page 6-4-5.

With Air Cushion

CM2 Mounting style Bore size — Stroke A Rod boot

• With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.



Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Air cushion |
| Piston speed | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style |

* Auto switch can be mounted.

Allowable Kinetic Energy

| Bore size (mm) | Effective cushion length (mm) | Kinetic energy absorbable (J) |
|----------------|-------------------------------|-------------------------------|
| 20 | 11.0 | 0.54 |
| 25 | 11.0 | 0.78 |
| 32 | 11.0 | 1.27 |
| 40 | 11.8 | 2.35 |

- For construction, refer to page 6-4-11.
- Since the dimensions of mounting style is the same as pages 6-4-13 to 6-4-20, refer to those pages.
- For other specifications, refer to page 6-4-5.

Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper |
| Piping | Built-in One-touch fittings |
| Piston speed | 50 to 750 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style |

* Auto switch can be mounted.

Applicable Tubing O.D./I.D.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|----------------------------|--|-----|-----|-----|
| Applicable bore size (mm) | 6/4 | 6/4 | 6/4 | 8/6 |
| Applicable tubing material | Can be used for either nylon, soft nylon or polyurethane tubing. | | | |

⚠ Caution

One-touch fitting cannot be replaced.

- One-touch fitting is press-fit into the cover, thus cannot be replaced.

Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Clean Series

10-CM2 Mounting style Bore size — Stroke

Clean Series (With relief port)

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

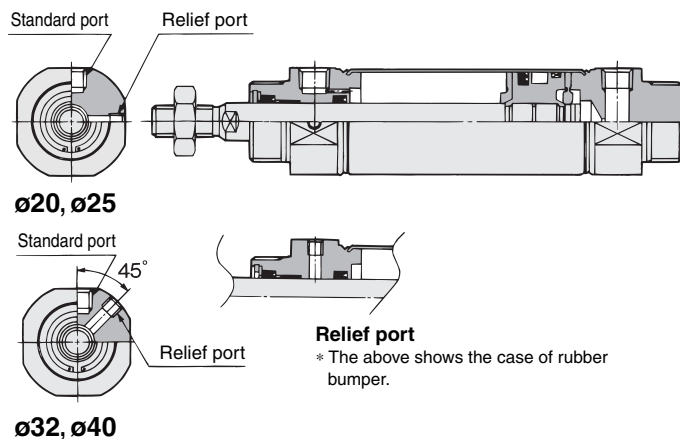


Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper, Air cushion |
| Relief port size | M5 x 0.8 |
| Piston speed | 30 to 400 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Boss-cut style |

* Auto switch can be mounted.

Construction



For details, refer to the separate catalog, "Pneumatic Clean Series".

Copper-free

20-CM2 Mounting style Bore size — Stroke

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

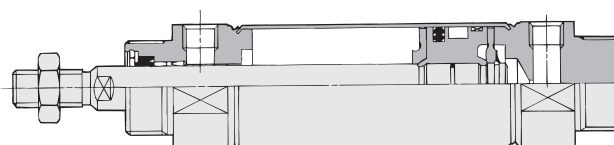


Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper Air cushion |
| Piston speed | 50 to 750 mm/s 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style |

* Auto switch can be mounted.

Construction



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2

Water Resistant

CM2

Mounting style

Bore size

R

Stroke

-XC6

Material of piston rod and rod end nut

| | |
|------|-----------------|
| Nil | Carbon steel |
| -XC6 | Stainless steel |

Water resistant type

| | |
|----------|----------------------------|
| R | NBR seals (Nitrile rubber) |
| V | FKM seals (Fluoro rubber) |

Ideal for use in a machine tool environment exposed to coolant mist.
Also suited for use in areas in which water splashes, such as food processing equipment or car washers.



⚠ Caution

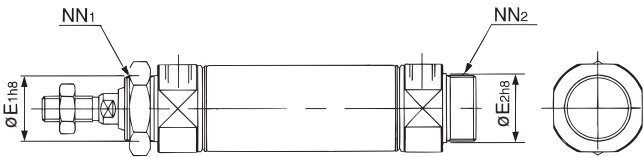
- Rod seal and scraper is not replaceable.
- Scraper is press-fit into the rod cover, thus cannot be replaced.

Specifications

| | |
|-------------------------|---------------------------|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper |
| Piping | Screw-in type |
| Piston speed | 50 to 750 mm/s |

* Auto switch can be mounted.

Dimensions

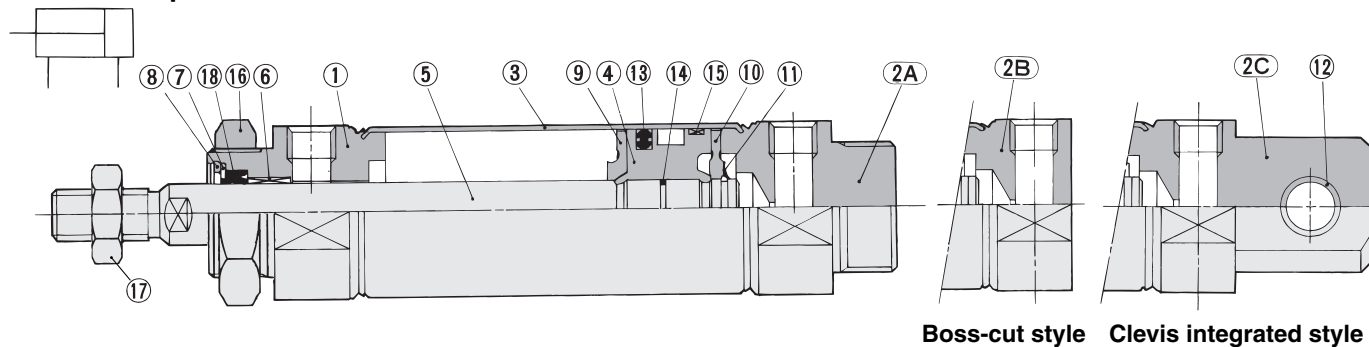


| Bore size (mm) | E ₁ | E ₂ * | NN ₁ | NN ₂ * |
|----------------|-----------------------------------|-----------------------------------|-----------------|-------------------|
| 20 | 22 ⁰ _{-0.033} | 20 ⁰ _{-0.033} | M22 x 1.5 | M20 x 1.5 |

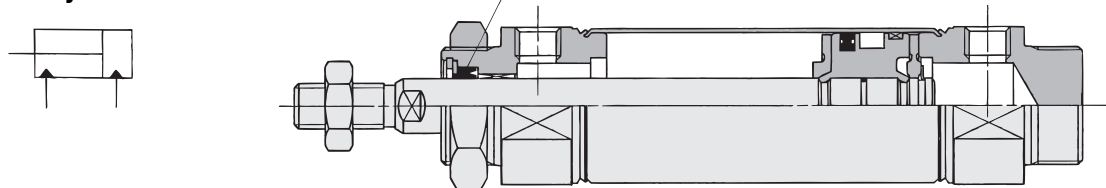
* Other dimensions are the same as double acting, single rod, standard type. (*: Same as the standard.)
Please contact SMC for part numbers of the foot, the flange and the mounting nut for

Construction

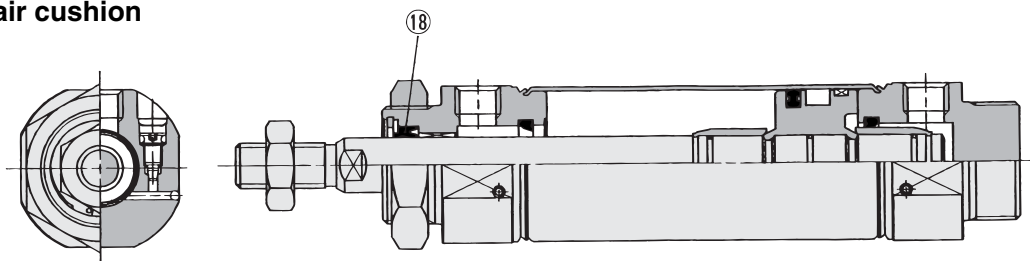
Rubber bumper



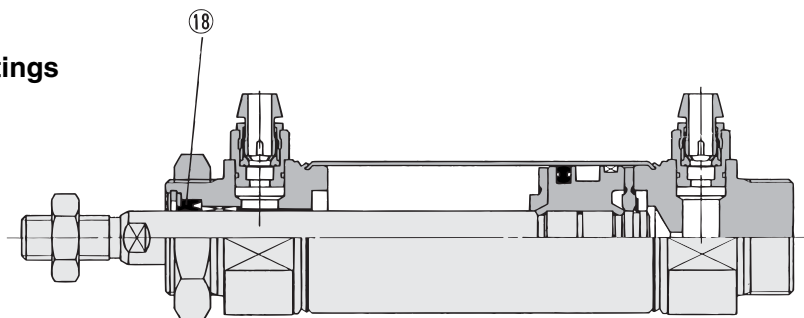
Air-hydro



With air cushion



Built-in One-touch fittings



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ②A | Head cover A | Aluminum alloy | Clear anodized * |
| ②B | Head cover B | Aluminum alloy | Clear anodized ** |
| ②C | Head cover B | Aluminum alloy | Clear anodized *** |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Carbon steel | Hard chrome plated |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Bumper A | Urethane | |
| ⑩ | Bumper B | Urethane | |
| ⑪ | Snap ring | Stainless steel | |

* Basic style, ** Boss-cut style, *** Clevis integrated style

| No. | Description | Material | Note |
|-----|----------------|--------------------------------|---------------|
| ⑫ | Clevis bushing | Oil-impregnated sintered alloy | |
| ⑬ | Piston seal | NBR | |
| ⑭ | Piston gasket | NBR | |
| ⑮ | Wear ring | Resin | |
| ⑯ | Mounting nut | Carbon steel | Nickel plated |
| ⑰ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts

With rubber bumper/With air cushion/Built-in One-touch fittings

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ⑱ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |

Air-hydro

| | | | | | | |
|---|----------|-----|-------|--------|---------|--------|
| ⑱ | Rod seal | NBR | HDU-8 | HDU-10 | HDU-12L | HDU-14 |
|---|----------|-----|-------|--------|---------|--------|

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

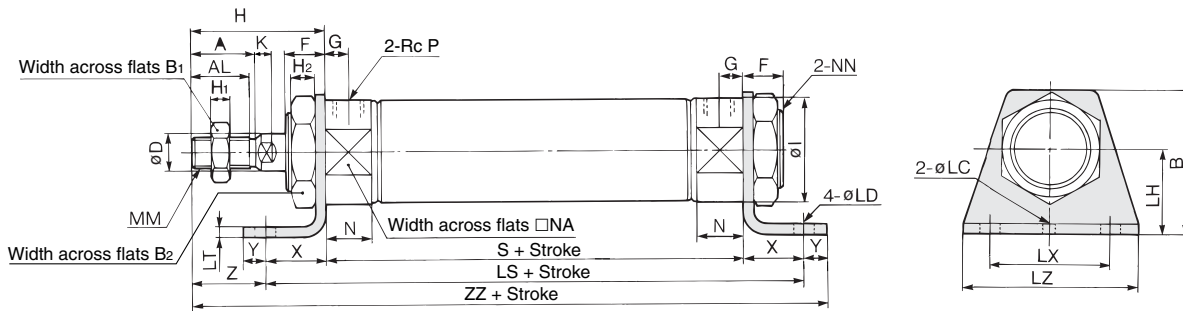
20-

Data

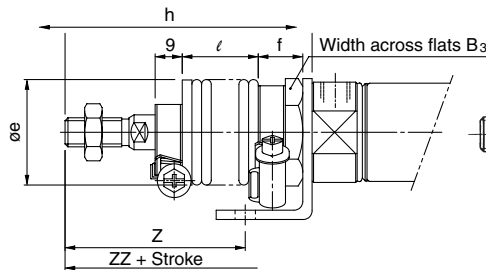
Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Axial Foot Style (L)

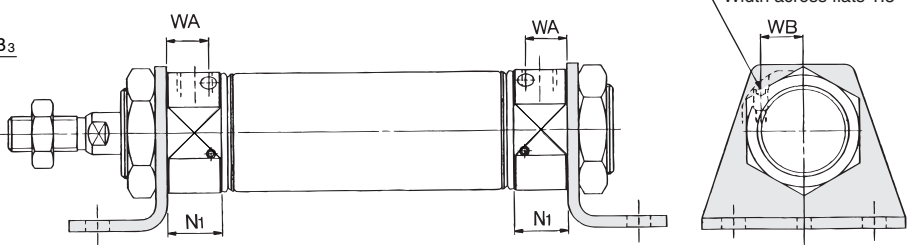
CM2L **Bore size** **Stroke**



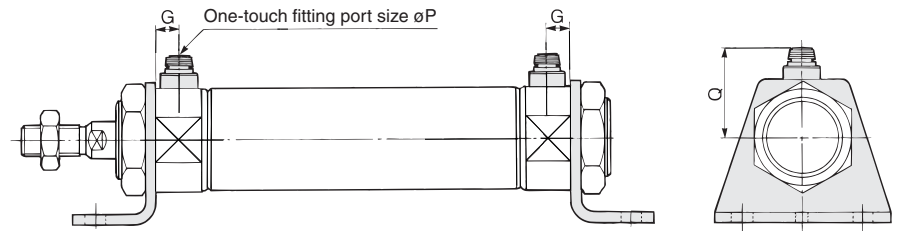
With rod boot



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B1 | B2 | D | F | G | H | H1 | H2 | I | K | LC | LD | LH | LS | LT | LX | LZ | MM | N | NA | NN | P | S | X | Y | Z | ZZ |
|----------------|----|------|----|----|----|----|----|----|----|----|----|------|-----|----|-----|----|-----|-----|----|----|------------|------|------|-----------|-----|----|----|----|----|-----|
| 20 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 8 | 41 | 5 | 8 | 28 | 5 | 4 | 6.8 | 25 | 102 | 3.2 | 40 | 55 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 20 | 8 | 21 | 131 |
| 25 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 4 | 6.8 | 28 | 102 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 20 | 8 | 25 | 135 |
| 32 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 4 | 6.8 | 28 | 104 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 20 | 8 | 25 | 137 |
| 40 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | 4 | 7 | 30 | 134 | 3.2 | 55 | 75 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 23 | 10 | 27 | 171 |

| Bore size (mm) | Symbol | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | z | | | | | | | |
|----------------|--------|----------------|----|------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | Stroke | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| 20 | | 30 | 36 | 18.2 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 48 | 61 | 73 | 86 | 111 | 136 | 161 | | | |
| 25 | | 32 | 36 | 18.2 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 | | | |
| 32 | | 32 | 36 | 18.2 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 52 | 65 | 77 | 90 | 115 | 140 | 165 | | | |
| 40 | | 41 | 46 | 20.2 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 54 | 67 | 79 | 92 | 117 | 142 | 167 | | | |

With Rod Boot

| Symbol Bore size (mm) Stroke | ZZ | | | | | | |
|------------------------------------|---------|-----------|------------|------------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 158 | 171 | 183 | 196 | 221 | 246 | 271 |
| 25 | 162 | 175 | 187 | 200 | 225 | 250 | 275 |
| 32 | 164 | 177 | 189 | 202 | 227 | 252 | 277 |
| 40 | 198 | 211 | 223 | 236 | 261 | 286 | 311 |

With Air Cushion

| Bore size (mm) | N1 | WA | WB |
|----------------|------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

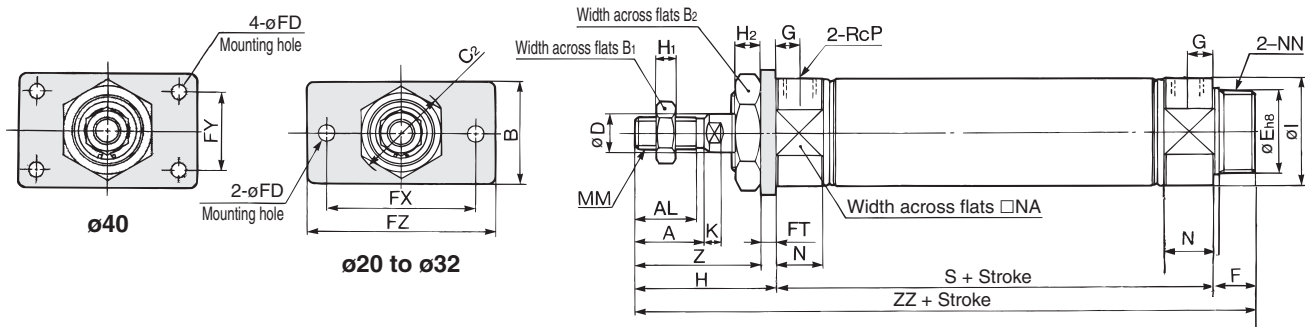
Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

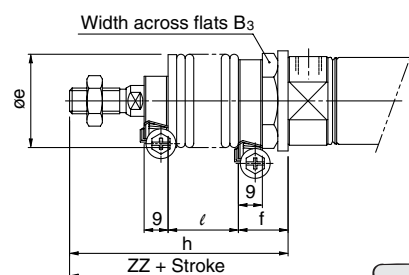
Series CM2

Rod Side Flange Style (F)

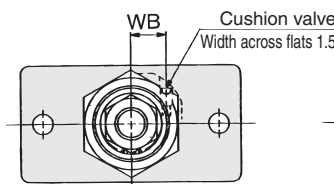
CM2F Bore size Stroke



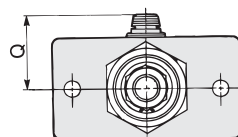
With rod boot



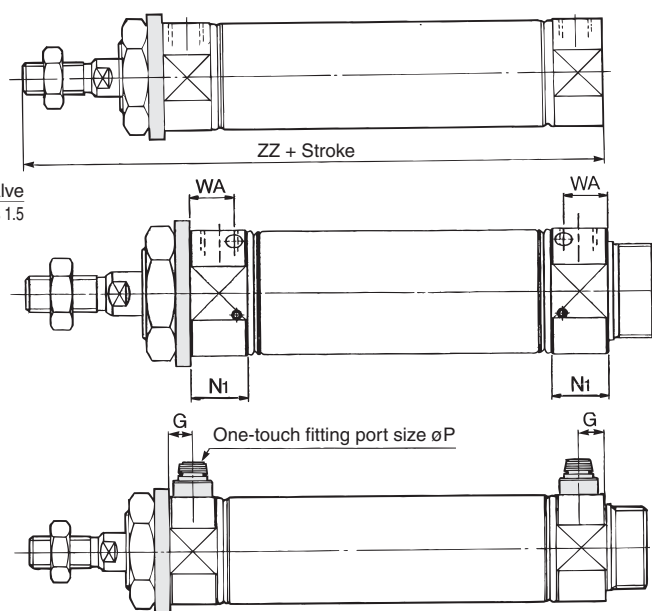
With air cushion



Built-in One-touch fittings



Boss-cut style



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | S | Z | ZZ |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|----|----|-----|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 37 | 116 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 41 | 120 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 41 | 122 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 45 | 154 |

| Symbol Stroke Bore size (mm) | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | ZZ | | | | | | | |
|---------------------------------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| 20 | 30 | 36 | 19 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 143 | 156 | 168 | 181 | 206 | 231 | 256 | | | |
| 25 | 32 | 36 | 19 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 147 | 160 | 172 | 185 | 210 | 235 | 260 | | | |
| 32 | 32 | 36 | 19 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 149 | 162 | 174 | 187 | 212 | 237 | 262 | | | |
| 40 | 41 | 46 | 22 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 181 | 194 | 206 | 219 | 244 | 269 | 294 | | | |

Boss-cut Style

| Bore size (mm) | Without rod boot | ZZ | | | | | | |
|-------------------|---------------------|---------------|-----------|------------|------------|------------|------------|------------|
| | | With rod boot | | | | | | |
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 103 | 130 | 143 | 155 | 168 | 193 | 218 | 243 |
| 25 | 107 | 134 | 147 | 159 | 172 | 197 | 222 | 247 |
| 32 | 109 | 136 | 149 | 161 | 174 | 199 | 224 | 249 |
| 40 | 138 | 165 | 178 | 190 | 203 | 228 | 253 | 278 |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

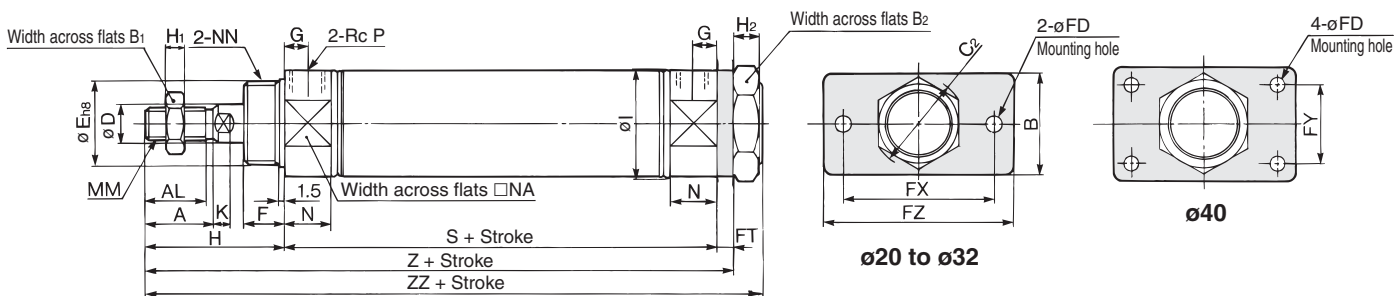
Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

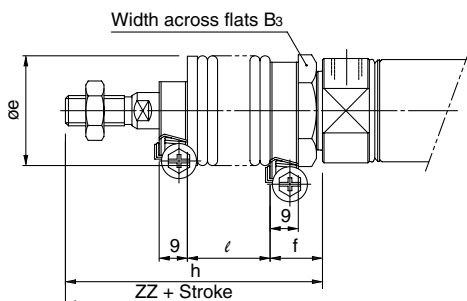
Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Head Side Flange Style (G)

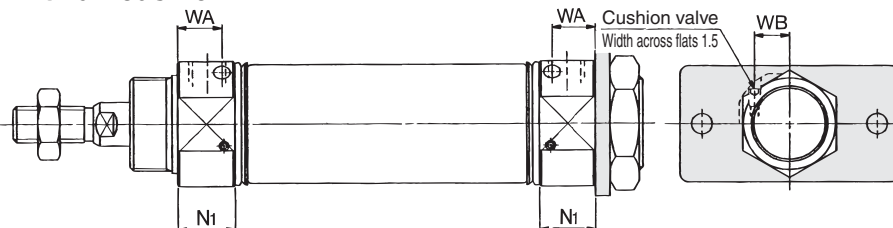
CM2G **Bore size** **Stroke**



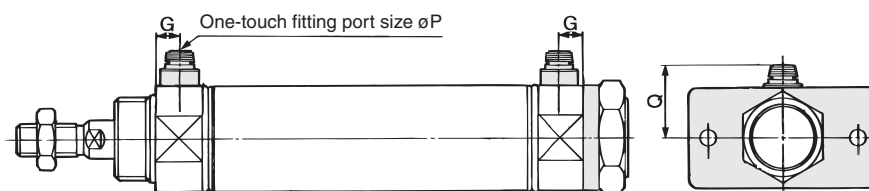
With rod boot



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----|----------------|----------------|------|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 |

| Bore size (mm) | K | MM | N | NA | NN | P | S | Z | ZZ |
|----------------|-----|------------|------|------|-----------|-----|----|-----|-----|
| 20 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 107 | 116 |
| 25 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 111 | 120 |
| 32 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 113 | 122 |
| 40 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 143 | 154 |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

With Rod Boot

| Bore size (mm) | Symbol Stroke | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | ZZ | | | | | | | |
|----------------|------------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| 20 | | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 143 | 156 | 168 | 181 | 206 | 231 | 256 | | | |
| 25 | | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 147 | 160 | 172 | 185 | 210 | 235 | 260 | | | |
| 32 | | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 149 | 162 | 174 | 187 | 212 | 237 | 262 | | | |
| 40 | | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 181 | 194 | 206 | 219 | 244 | 269 | 294 | | | |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

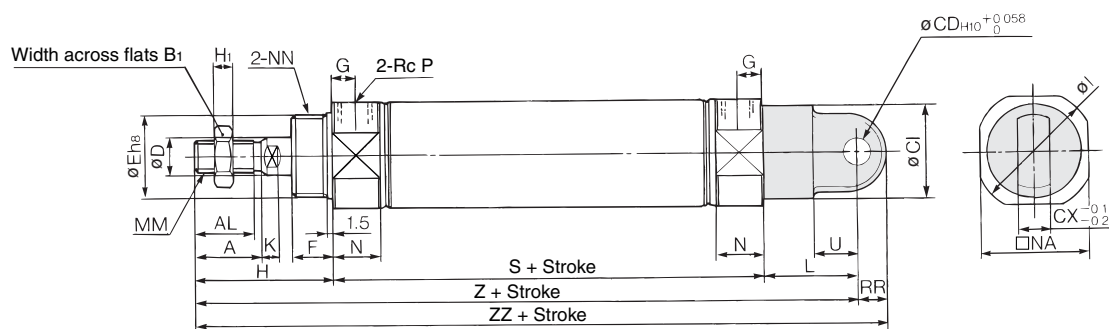
20-

Data

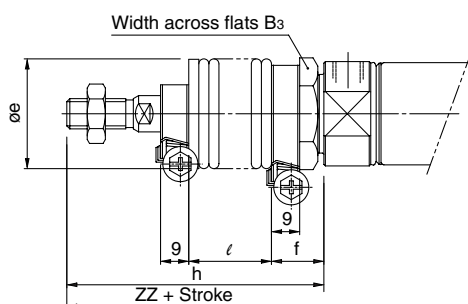
Series CM2

Single Clevis Style (C)

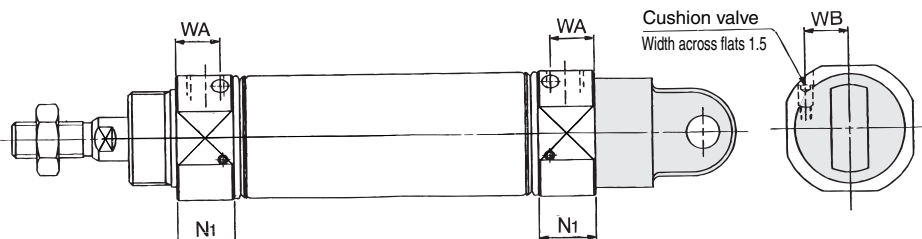
CM2C Bore size Stroke



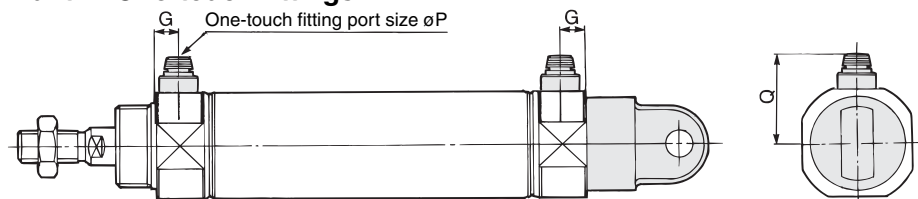
With rod boot



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | CI | CD | CX | D | E | F | G | H | H ₁ | I | K | L | MM | N | NA | NN | P | RR | S | U | Z | ZZ |
|----------------|----|------|----------------|----|----|----|----|-----------------------------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|----|----|-----|-----|
| 20 | 18 | 15.5 | 13 | 24 | 9 | 10 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 9 | 62 | 14 | 133 | 142 |
| 25 | 22 | 19.5 | 17 | 30 | 9 | 10 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 62 | 14 | 137 | 146 |
| 32 | 22 | 19.5 | 17 | 30 | 9 | 10 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 64 | 14 | 139 | 148 |
| 40 | 24 | 21 | 22 | 38 | 10 | 15 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 11 | 88 | 18 | 177 | 188 |

With Rod Boot

| Symbol Stroke Bore size (mm) | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | Z | | | | | | | |
|------------------------------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 160 | 173 | 185 | 198 | 223 | 248 | 273 | | | |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 164 | 177 | 189 | 202 | 227 | 252 | 277 | | | |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 166 | 179 | 191 | 204 | 229 | 254 | 279 | | | |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 204 | 217 | 229 | 242 | 267 | 292 | 317 | | | |

| <div><div>Symbol</div><div>Stroke</div></div> <div>Bore size (mm)</div> | ZZ | | | | | | |
|---|---------|-----------|------------|------------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 169 | 182 | 194 | 207 | 232 | 257 | 282 |
| 25 | 173 | 186 | 198 | 211 | 236 | 261 | 286 |
| 32 | 175 | 188 | 200 | 213 | 238 | 263 | 288 |
| 40 | 215 | 228 | 240 | 253 | 278 | 303 | 328 |

With Air Cushion

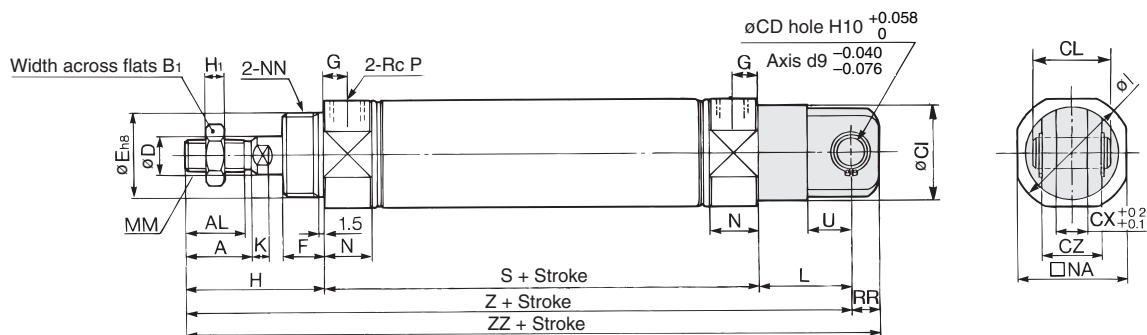
| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

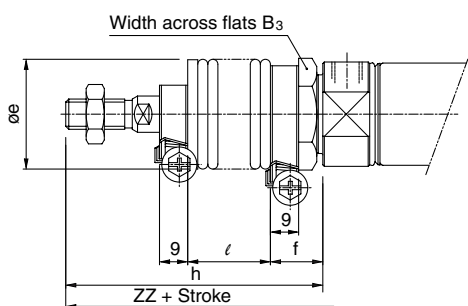
| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

Double Clevis Style (D)

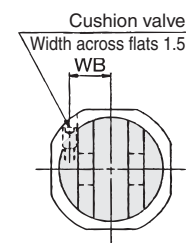
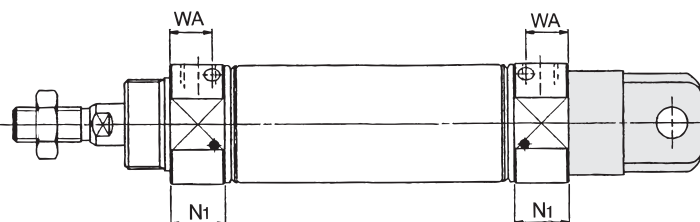
CM2D Bore size — Stroke



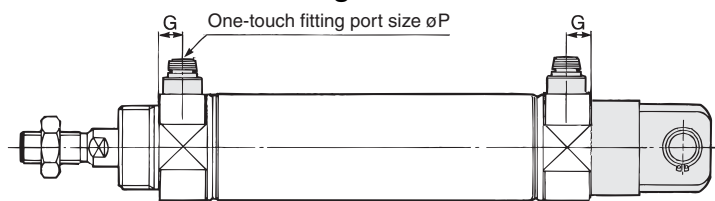
With rod boot



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | CD | CI | CL | CX | CZ | D | E | F | G | H | H ₁ | I | K | L | MM | N | NA | NN | P | RR | S | U | Z | ZZ |
|----------------|----|------|----------------|----|----|------|----|----|----|-----------------------------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|----|----|-----|-----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 25 | 10 | 19 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 9 | 62 | 14 | 133 | 142 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 62 | 14 | 137 | 146 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 64 | 14 | 139 | 148 |
| 40 | 24 | 21 | 22 | 10 | 38 | 41.2 | 15 | 30 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 11 | 88 | 18 | 177 | 188 |

* Clevis pin and snap ring (cotter pin for bore size ø40) are shipped together.

With Rod Boot

| Symbol Stroke | B ₃ | e | f | h | | | | | | | | ℓ | | | | | | | | Z | | | | | | | |
|------------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| Bore size (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 160 | 173 | 185 | 198 | 223 | 248 | 273 | | | |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 164 | 177 | 189 | 202 | 227 | 252 | 277 | | | |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 166 | 179 | 191 | 204 | 229 | 254 | 279 | | | |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 204 | 217 | 229 | 242 | 267 | 292 | 317 | | | |

With Rod Boot

| Symbol Bore size (mm) Stroke | ZZ | | | | | | |
|------------------------------------|---------|-----------|------------|------------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 169 | 182 | 194 | 207 | 232 | 257 | 282 |
| 25 | 173 | 186 | 198 | 211 | 236 | 261 | 286 |
| 32 | 175 | 188 | 200 | 213 | 238 | 263 | 288 |
| 40 | 215 | 228 | 240 | 253 | 278 | 303 | 328 |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

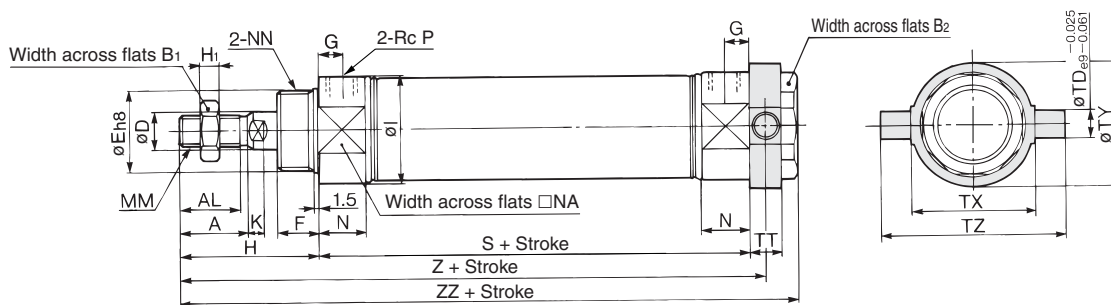
20-

Data

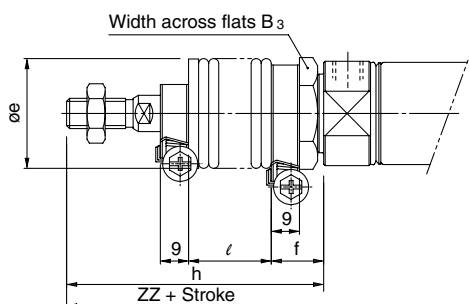
Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Head Side Trunnion Style (T)

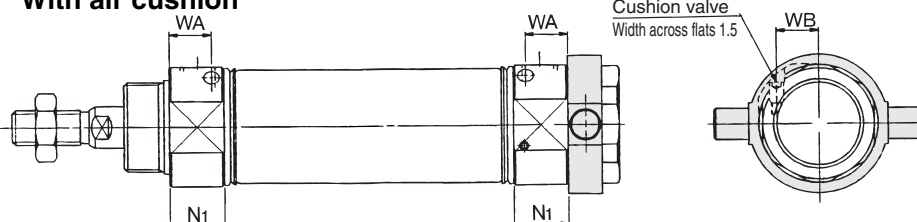
CM2T **Bore size** **Stroke**



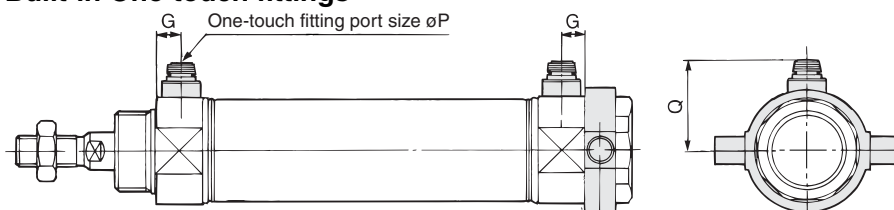
With rod boot



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | I | K | MM | N | NA | NN | P |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|------|-----|------------|------|------|-----------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 |

| Bore size (mm) | S | TD | TT | TX | TY | TZ | Z | ZZ |
|----------------|----|----|----|----|----|----|-------|-----|
| 20 | 62 | 8 | 10 | 32 | 32 | 52 | 108 | 118 |
| 25 | 62 | 9 | 10 | 40 | 40 | 60 | 112 | 122 |
| 32 | 64 | 9 | 10 | 40 | 40 | 60 | 114 | 124 |
| 40 | 88 | 10 | 11 | 53 | 53 | 77 | 143.5 | 154 |

With Rod Boot

| <div><div>Symbol</div><div>Bore size (mm)</div><div>Stroke</div></div> | B ₃ | e | f | h | | | | | | | |
|--|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|--|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | |

With Rod Boot

| Symbol Stroke Bore size (mm) | ℓ | | | | | | | | Z | | | | | | | | ZZ | | | | | | | |
|------------------------------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|--|--|--|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | | | |
| 20 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 135 | 148 | 160 | 173 | 198 | 223 | 248 | 145 | 158 | 170 | 183 | 208 | 233 | 258 | | | |
| 25 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 139 | 152 | 164 | 177 | 202 | 227 | 252 | 149 | 162 | 174 | 187 | 212 | 237 | 262 | | | |
| 32 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 141 | 154 | 166 | 179 | 204 | 229 | 254 | 151 | 164 | 176 | 189 | 214 | 239 | 264 | | | |
| 40 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 | 170.5 | 183.5 | 195.5 | 208.5 | 233.5 | 258.5 | 283.5 | 181 | 194 | 206 | 219 | 244 | 269 | 294 | | | |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

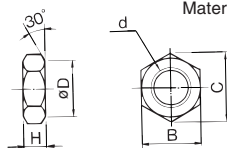
20-

Data

Series CM2

Rod End Nut

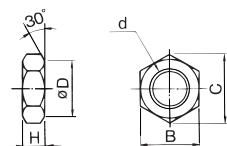
Material: Carbon steel



| Part no. | Applicable bore size (mm) | B | C | D | d | H |
|----------|---------------------------|----|------|------|------------|---|
| NT-02 | 20 | 13 | 15.0 | 12.5 | M8 x 1.25 | 5 |
| NT-03 | 25, 32 | 17 | 19.6 | 16.5 | M10 x 1.25 | 6 |
| NT-04 | 40 | 22 | 25.4 | 21.0 | M14 x 1.5 | 8 |

Mounting Nut

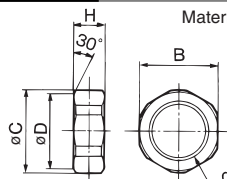
Material: Carbon steel



| Part no. | Applicable bore size (mm) | B | C | D | d | H |
|----------|---------------------------|----|------|------|-----------|----|
| SN-020B | 20 | 26 | 30 | 25.5 | M20 x 1.5 | 8 |
| SN-032B | 25, 32 | 32 | 37 | 31.5 | M26 x 1.5 | 8 |
| SN-040B | 40 | 41 | 47.3 | 40.5 | M32 x 2.0 | 10 |

Trunnion Nut

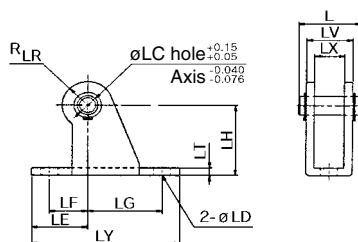
Material: Carbon steel



| Part no. | Applicable bore size (mm) | B | C | D | d | H |
|----------|---------------------------|----|----|------|-----------|----|
| TN-020B | 20 | 26 | 28 | 25.5 | M20 x 1.5 | 10 |
| TN-032B | 25, 32 | 32 | 34 | 31.5 | M26 x 1.5 | 10 |
| TN-040B | 40 | 41 | 45 | 40.5 | M32 x 2 | 10 |

Clevis Pivot Bracket (For CM2E)

Material: Rolled steel plate

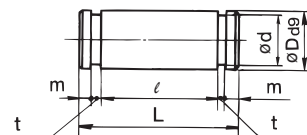


| Part no. | Applicable bore size (mm) | L | LC | LD | LE | LF | LG | LH | LR | LT | LX | LY | LV | Applicable pin part no. |
|----------|---------------------------|------|----|-----|----|----|----|----|----|-----|----|----|------|-------------------------|
| CM-E020B | 20, 25 | 24.5 | 8 | 6.8 | 22 | 15 | 30 | 30 | 10 | 3.2 | 12 | 59 | 18.4 | CD-S02 |
| CM-E032B | 32, 40 | 34 | 10 | 9 | 25 | 15 | 40 | 40 | 13 | 4 | 20 | 75 | 28 | CD-S03 |

Note) It cannot be used for single clevis style (CM2C) and double clevis style (CM2D).

Clevis Pin (For CM2E)

Material: Carbon steel



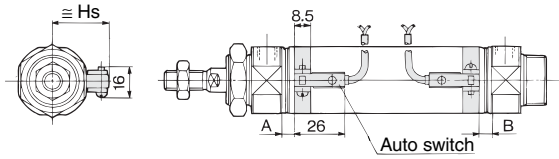
| Part no. | Applicable bore size (mm) | Dd9 | d | L | ℓ | m | t | Applicable snap ring part no. |
|----------|---------------------------|--|-----|------|------|------|------|-------------------------------|
| CD-S02 | 20, 25 | 8 ^{+0.040} _{-0.076} | 7.6 | 24.5 | 19.5 | 1.6 | 0.9 | Type C 8 for axis |
| CD-S03 | 32, 40 | 10 ^{+0.040} _{-0.076} | 9.6 | 34 | 29 | 1.35 | 1.15 | Type C 10 for axis |

Regarding mounting bracket, accessory made of stainless steel (Some are not available.), refer to page 6-17-32 for -XB12, External stainless steel cylinder.

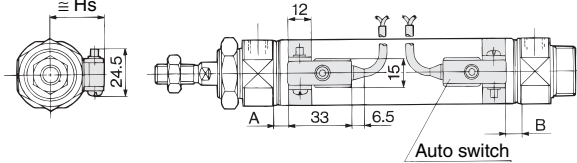
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Reed switch

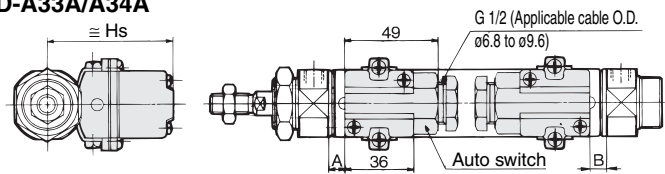
D-C7/C8



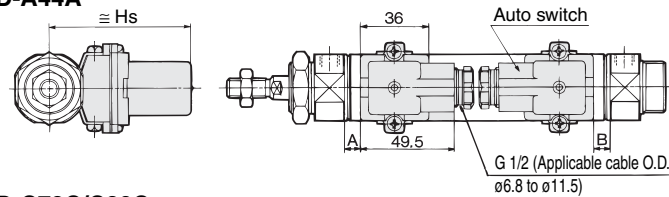
D-B5/B6/B59W



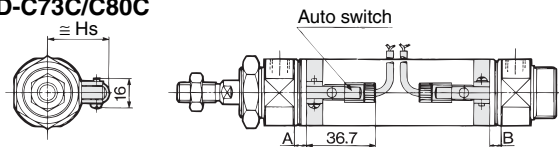
D-A33A/A34A



D-A44A

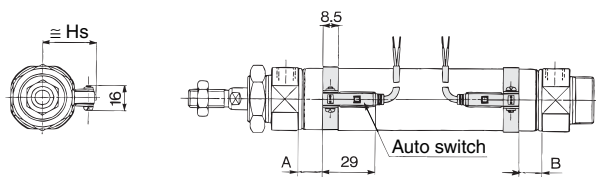


D-C73C/C80C

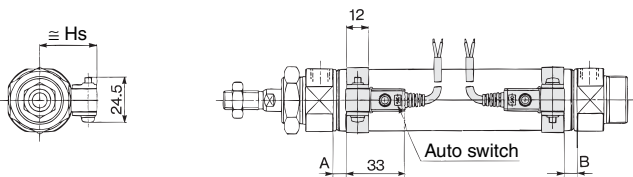


Solid state switch

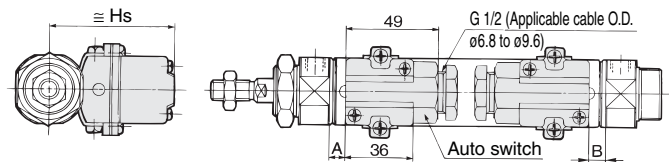
D-H7□/H7□W/H7NF/H7BAL



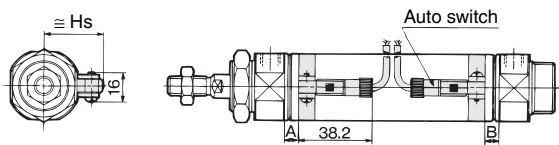
D-G5NTL



D-G39A/K39A



D-H7C



Proper Auto Switch Mounting Position

| Auto switch model | D-B5 D-B6 | | D-C7□ D-C80 D-C73C D-C80C | | D-B59W | | D-A3□A D-G39A D-K39A D-A44A | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | | D-G5NTL | |
|-------------------|--------------|------|------------------------------------|------|--------|------|--------------------------------------|--------|---|------|----------|----------|
| | A | B | A | B | A | B | A | B | A | B | A | B |
| 20 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 25 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 32 | 2(0) | 1(0) | 8(6) | 7(5) | 5(3) | 4(2) | 1.5(0) | 0.5(0) | 7(5) | 6(4) | 3.5(1.5) | 2.5(0.5) |
| 40 | 7 | 6 | 13 | 12 | 10 | 9 | 6.5 | 5.5 | 12 | 11 | 8.5 | 7.5 |

* (): Denotes the values with air cushion.

D-B5/B6/A3□A/A44A/G39A/K39A cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

Auto Switch Mounting Height

| D-B5 D-B6 D-B59W D-G5NTL D-H7C | D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A3□A D-G39A D-K39A | D-A44A |
|--|--|------------------|----------------------------|--------|
| Hs | Hs | Hs | Hs | Hs |
| 25.5 | 22.5 | 25 | 60 | 69.5 |
| 28 | 25 | 27.5 | 62.5 | 72 |
| 31.5 | 28.5 | 31 | 66 | 75.5 |
| 35.5 | 32.5 | 35 | 70 | 79.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Operating Range

| Auto switch model | Bore size (mm) | | | |
|--------------------------------|----------------|-----|-----|----|
| | 20 | 25 | 32 | 40 |
| D-C7□/C80, D-C73C/C80C | 7 | 8 | 8 | 8 |
| D-B5□/B64, D-A3□A/A44A | 8 | 8 | 9 | 9 |
| D-B59W | 12 | 12 | 13 | 13 |
| D-H7□, D-H7□W/H7BAL/G5NTL/H7NF | 4 | 4 | 4.5 | 5 |
| D-H7C | 7 | 8.5 | 9 | 10 |
| D-H7LF | 5 | 5 | 5.5 | 6 |
| D-G39A/K39A | 8 | 9 | 9 | 9 |

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately $\pm 30\%$ dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

| Type | Model | Electrical entry | Features |
|--------------------|---------|------------------|-------------------------|
| Reed switch | D-C80 | Grommet | Without indicator light |
| | D-C80C | Connector | |
| | D-B53 | Grommet | — |
| | D-B64 | Grommet | Without indicator light |
| Solid state switch | D-G5NTL | Grommet | With timer |

* With pre-wire connector is available for D-G5NTL type, too. Refer to page 6-16-55 for details.

* Wide range detection type, solid state auto switch (D-G5NBL type) is also available. For details, refer to page 6-16-59.

Made to Order Common Specifications: -XB6: Heat Resistant Cylinder (−10 to 150°C)

2 Heat Resistant Cylinder (−10 to 150°C)

Symbol

-XB6

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from −10°C.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------------------------|---|-----------|---------------------------|---|--------------------------|
| CJP | Pin cylinder | CJP | Double acting, Single rod | Except clevis and trunnion style | 6 |
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | Except with air cushion | 6 |
| | | CJ2W | Double acting, Double rod | Except with air cushion | |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | CM2W | Double acting, Double rod | | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | | |
| | | CM2KW | Double acting, Double rod | | |
| | Direct mount type | CM2R | Double acting, Single rod | | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | Except with rubber bumper | 6 |
| | Double rod type | CG1W | Double acting, Double rod | Except with rubber bumper | |
| | Direct mount type | CG1R | Double acting, Single rod | Except with rubber bumper | |
| MB | Air cylinder | MB | Double acting, Single rod | Except without air cushion | 6 |
| | | MBW | Double acting, Double rod | Except without air cushion | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | Except without air cushion | 6 |
| | | MB1W | Double acting, Double rod | Except without air cushion | |
| CA2 | Air cylinder | CA2□N | Double acting, Single rod | | 6 |
| | | CA2W□N | Double acting, Double rod | | |
| | Cylinder with end lock | CBA2 | Double acting, Single rod | | |
| CS1 | Air cylinder | CS1□N | Double acting, Single rod | Applicable bore size (125 to 200mm) | 6 |
| | | CS1W□N | Double acting, Double rod | | |
| C76 | Air cylinder | C76 | Double acting, Single rod | Refer to page 6-10-46. | 6 |
| | | C76W | Double acting, Double rod | Refer to page 6-10-46. | |
| C85 | ISO cylinder | C85 | Double acting, Single rod | Refer to page 6-11-47. | 6 |
| | | C85W | Double acting, Double rod | Refer to page 6-11-47. | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| CP95 | ISO cylinder | CP95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| CU | Free mount cylinder | CU | Double acting, Single rod | | 7 |
| | Non-rotating rod type | CUK | Double acting, Single rod | | |
| CQS | Compact cylinder | CQS | Double acting, Single rod | Except with rubber bumper | 7 |
| | | CQSW | Double acting, Double rod | Except with rubber bumper | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | Except with rubber bumper | 7 |
| | | CQ2W | Double acting, Double rod | Except with rubber bumper | |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | Except with rubber bumper | |
| MK | Rotary clamp | MK | Double acting | | 10 |
| MGP MGQ | Compact guide cylinder | MGPM | Double acting | | 8 |
| | | MGQ | Double acting | | 8 |
| MGG | Guide cylinder | MGG | Double acting | Except with shock absorber, with rubber cushion | 8 |
| MGC | | MGC | Compact type | Except with rubber bumper | 8 |
| CY1 | Magnetically coupled rodless cylinder | CY1B | Basic type | | 8 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

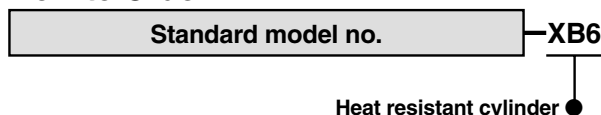
Made to Order Common Specifications: -XB6: Heat Resistant Cylinder (−10 to 150°C)

2 Heat Resistant Cylinder (−10 to 150°C)

Symbol

-XB6

How to Order



Specifications

| | |
|---|--|
| Ambient temperature range | −10 to 150°C (0 to 150°C for Series CS1) |
| Seals materials | Fluoro rubber |
| Grease | Heat resistant grease |
| Specifications other than above and external dimensions | Same as standard type |

Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

- Note 1) Operate without lubrication from a pneumatic system lubricator.
- Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
- Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. But, as for the one with auto switch, and the heat resistant cylinder with heat resistant auto switch, since it will be differed depending on the series, please contact SMC.
- Note 4) Piston speed is ranged from 50 to 500 mm/s. But, for MGQ□80, 100 and MGP□80, 100, it will be 50 to 400 mm/s. 50 to 200 mm/s for Series MK. Please contact SMC for operating speed of Series CY1B.
- Note 5) Please contact SMC for Series CQ2 and MGQ with rubber bumper.
- Note 6) As for the ambient temperature range of Series CY1B, since the magnetic holding force will be varied depending on the operating conditions, make sure that by referring to page 6-17-22.

How to Order

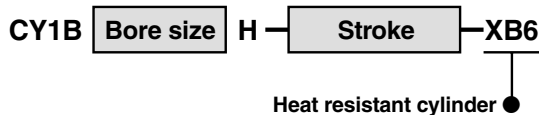
C95
CP95 Standard model no. →Details on pages 6-12-2 and 6-13-4 —XB6

Heat resistant cylinder(150°C) ●

Specifications

| | |
|-------------------------------|--|
| Applicable cylinder | Air cylinder/Standard |
| Series | C95/CP95 |
| Action | Double acting/Single rod Double acting/Double rod |
| Bore size(mm) | 32, 40, 50, 63, 80, 100 |
| Mounting | Basic, Foot, Flange, Clevis, Trunnion |
| Ambient and fluid temperature | −10 to 150°C |
| Packing material | Fluorine rubber |
| Grease | Heat resistant grease |

How to Order



Specifications

| Applicable size | CY1B |
|-------------------------------|-----------------|
| Bore size (mm) | 6 to 63 |
| Ambient and fluid temperature | 50 to 150°C* |
| Maximum operating pressure | 0.5 MPa |
| Piston speed | 50 to 400 mm/s* |

* When using in less than 100°C range, since it could make a difference in the maintenance cycle, depending on the operating speed, use it at 200 mm/s or less.

Operating Pressure Limit for Intermediate Stop and Vertical Operation

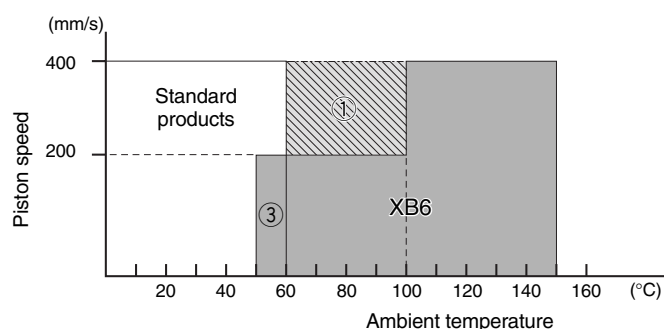
| | |
|---|----------|
| Maximum operating pressure at the intermediate stop | 0.4 MPa* |
|---|----------|

* Use caution that the magnet coupling will be removed, if it is used to stop in an intermediate stroke by an external stopper with the operating pressure over 0.4 MPa.

Magnetic Holding Force

| Bore size (mm) | 6 | 10 | 15 | 20 | 25 | 32 | 40 | 50 | 63 |
|-----------------------------|------|------|------|-----|-----|-----|-----|------|------|
| Holding force (at 150°C) | 14.4 | 40.0 | 90.1 | 160 | 250 | 410 | 641 | 1000 | 1590 |
| Holding force (at 100°C) | 17.2 | 47.9 | 107 | 192 | 299 | 490 | 766 | 1190 | 1900 |

Temperature Range for Operating Cylinder and Piston Speed



- When using with the operating temperature from 60 up to 100°C, and the piston speed of more than 200 mm/s, please consult with SMC separately.
- When using with the operating temperature from 50 up to 100°C, and the piston speed of less than 200 mm/s, XB6 specifications can be used.
- As for XB6, regarding the temperature range (over 50 to 60°C) which overlaps the one of standard products, consider the tendency of operating temperature (upper, lower limits), then choose a model.

When using with the operating temperature fluctuated between 50°C or less and 100°C or more, the operating speed, etc. will be largely restricted by the durability. Prior to use, please contact SMC.

<Reference>

Maintenance cycle for XB6 could vary substantially, depending on the operating condition and the ambient temperature. Even if using in our recommended range, as a guide, conduct it in around 1/2 intervals, compared to the standard products.

Made to Order Common Specifications: -XB7: Cold Resistant Cylinder

3 Cold Resistant Cylinder

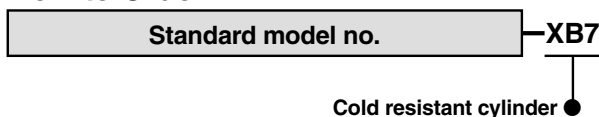
Symbol
-XB7

Air cylinder which changed the seal material and grease, so that it could be used even at lower temperature down to -40°C.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|------------|---|-------|---------------------------|---|--------------------------|
| CJP | Pin cylinder | CJP | Double acting, Single rod | Except clevis, trunnion style, with switch | 6 |
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | Except with air cushion, switch | 6 |
| | | CJ2W | Double acting, Double rod | Except with air cushion, switch | |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | Except with air cushion | 6 |
| | | CM2W | Double acting, Double rod | Except with air cushion | |
| | Direct mount type | CM2R | Double acting, Single rod | Except with air cushion | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | Except with air cushion | 6 ⁽⁶⁾ |
| | | CG1W | Double acting, Double rod | Except with air cushion | |
| | Direct mount type | CG1R | Double acting, Single rod | Except with air cushion | |
| C76 | Air cylinder | C76 | Double acting, Single rod | Refer to page 6-10-46. | 6 |
| | | C76W | Double acting, Double rod | Refer to page 6-10-46. | |
| C85 | ISO cylinder | C85 | Double acting, Single rod | Refer to page 6-11-47. | 6 |
| | | C85W | Double acting, Double rod | Refer to page 6-11-47. | |
| CU | Free mount cylinder | CU | Double acting, Single rod | Except with switch | 7 |
| | Non-rotating rod type | CUK | Double acting, Single rod | Except with switch | |
| CQS | Compact cylinder | CQS | Double acting, Single rod | Except with switch, with rubber bumper, with bracket | 7 |
| | | CQSW | Double acting, Double rod | Except with switch, with rubber bumper, with bracket | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | Except ø50 or more, with switch, with rubber bumper, with bracket | 7 |
| | | CQ2W | Double acting, Double rod | Except ø50 or more, with switch, with rubber bumper, with bracket | |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | Except ø50 or more, with switch, with rubber bumper, with bracket | |

How to Order



Specifications

| | |
|---------------------------|-----------------------|
| Ambient temperature range | -40 to 70°C |
| Seals material | Low nitrile rubber |
| Grease | Cold resistant grease |
| Auto switch | Not mountable |
| Dimensions | Same as standard type |
| Additional specifications | Same as standard type |



- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Use dry air which is suitable for heatless air dryer, etc. not to cause the moisture to be frozen.
 Note 3) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 4) Mounting auto switch is impossible.
 Note 5) Please contact SMC for the one with rubber bumper for CQ2, CQS.
 Note 6) No cushion type is adopted.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XB9: Low Speed Cylinder (10 to 50 mm/s)

4 Low Speed Cylinder

Symbol

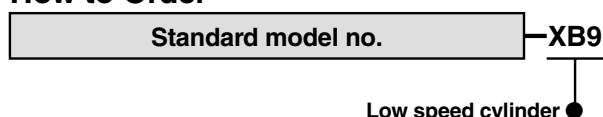
-XB9

Even if driving at lower speeds 10 to 50 mm/s, there would be no stick-slip phenomenon and it can run smoothly.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|------------|---|-------|---------------------------|--|--------------------------|
| CJP | Pin cylinder | CJP | Double acting, Single rod | | 6 |
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | Except with air cushion | 6 |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | Except with air-hydro, with air cushion, with gaiter | 6 |
| | Direct mount type | CM2R | Double acting, Single rod | Except with air cushion | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | Except with air cushion | 6 |
| | Direct mount type | CG1R | Double acting, Single rod | Except with air cushion | |
| C76 | Air cylinder | C76 | Double acting, Single rod | Refer to page 6-10-46. | 6 |
| C85 | ISO cylinder | C85 | Double acting, Single rod | Refer to page 6-11-47. | 6 |
| CU | Free mount cylinder | CU | Double acting, Single rod | | 7 |
| | Non-rotating rod type | CUK | Double acting, Single rod | | |
| | Long stroke standard type | CU | Double acting, Single rod | | |
| | Long stroke, Non-rotating rod type | CUK | Double acting, Single rod | | |
| CQS | Compact cylinder | CQS | Double acting, Single rod | | 7 |
| | | CQSW | Double acting, Double rod | | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | | 7 |
| | | CQ2W | Double acting, Double rod | | |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | | |
| MGQ | Compact cylinder with guide | MGQ | Double acting | | 8 |
| CY1 | Magnetically coupled rodless cylinder | CY1B | Double acting | | 8 |
| | | CY1S | Double acting | | |

How to Order



Note) Operate without lubrication from a pneumatic system lubricator.

Specifications

| | |
|---------------------------|--|
| Piston speed | 10 to 50 mm/s (Series CY1 is ranged between 15 and 50 mm/s.) |
| Dimensions | Same as standard type |
| Additional specifications | Same as standard type |

⚠ Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Made to Order Common Specifications: -XB13: Low Speed Cylinder (5 to 50 mm/s)

8 Low Speed Cylinder Symbol **-XB13**

Even if driving at lower speeds 5 to 50 mm/s (CY1: 7 to 50 mm/s), there would be no stick-slip phenomenon and it can run smoothly.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|---|-------------------------------|---------------------------|-----------------------------------|--------------------------|
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | Except with air cushion | 6 |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | Except with air cushion | 6 |
| | Direct mount type | CM2R | Double acting, Single rod | Except with air cushion | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | Except with air cushion | 6 |
| | Direct mount type | CG1R | Double acting, Single rod | Except with air cushion | |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| C95P | ISO cylinder | CP95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| CU | Free mount cylinder | CU | Double acting, Single rod | | 7 |
| | Non-rotating rod type | CUK | Double acting, Single rod | | |
| | Long stroke, standard type | CU | Double acting, Single rod | | |
| | Long stroke, non-rotating rod type | CUK | Double acting, Single rod | | |
| CQS | Compact cylinder | CQS | Double acting, Single rod | | 7 |
| | | CQSW | Double acting, Double rod | | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | | 7 |
| | | CQ2W | Double acting, Double rod | | |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | | |
| CXW | Slide unit | CXWM | Slide bearing type | | 8 |
| | | CXWL | Ball bushing bearing type | | |
| MXU | Compact slide | MXU | | | 8 |
| CXS | Dual rod cylinder | CXS | Standard type | | 8 |
| MGP | Compact guide cylinder | MGP ^M _L | Standard type | | 8 |
| MGG | Guide cylinder | MGGM | Slide bearing type | Shock absorber cannot be mounted. | 8 |
| MGC | | MGCM | Slide bearing type | With rubber bumper | 8 |
| CY1/3 | Magnetically coupled rodless cylinder | CY1B/CY3B | Basic type | | 8 |
| | | CY1S | Slide bearing type | | |
| | | CY1L | Ball bushing bearing type | | |
| CXT | Platform cylinder | CXT | Standard type | Except long stroke | 8 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

How to Order

Standard model no. **-XB13**

Low speed cylinder ●

Specifications

| | |
|--------------------------|------------------------------------|
| Piston speed | 5 to 50 mm/s (CY1/3: 7 to 50 mm/s) |
| Dimensions | Same as standard type |
| Additional specification | Same as standard type |

- Note 1) Operate without lubrication from a pneumatic system lubricator.
Note 2) For the speed adjustment, use speed controllers for controlling at lower speeds. (Series AS-FM/AS-M)

How to Order

C95 CP95 Standard model no. →Details on pages 6-12-2 and 6-13-4 **-XB13**

Low speed cylinder (5 to 50 mm/s) ●

Specifications

| | |
|---------------------|--|
| Applicable cylinder | Air cylinder/Standard |
| Series | C95/CP95 |
| Action | Double acting/Single rod Double acting/Double rod |
| Bore size(mm) | 32, 40, 50, 63, 80, 100 |
| Piston speed | 5 to 50mm/s |
| Cushion | Air cushion |
| Auto switch | Available for mounting |
| Mounting | Basic, Foot, Flange, Clevis, Trunnion |

Made to Order Common Specifications: -XC3: Special Port Location

11 Special Port Location

Compared with the standard type, a cylinder which changes the connection port location of rod/head cover and the location of cushion valve.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|------------|-------------------------------------|-------|--------------------------------------|---|--------------------------|
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | Except w/ rail mounting style auto switches, w/ air cushion | 6 |
| | Non-rotating rod type | CJ2K | Double acting, Single rod | Except w/ rail mounting style auto switches | |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | | Single acting (Spring return/extend) | | |
| | | CM2W | Double acting, Double rod | | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | | |
| | | | Single acting (Spring return/extend) | | |
| | | CM2KW | Double acting, Double rod | | |
| | Direct mount type | CM2R | Double acting, Single rod | | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | | |
| | Low friction type | CM2Q | Double acting, Single rod | | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | | |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| | Non-rotating rod type | MBK | Double acting, Single rod | | |
| | Low friction type | MB□Q | Double acting, Single rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| | Non-rotating rod type | MB1K | Double acting, Single rod | | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | | 6 |
| | | CA2W | Double acting, Double rod | | |
| | Low friction type | CA2□Q | Double acting, Single rod | | |
| | Cylinder with end lock | CBA1 | Double acting, Single rod | | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | | 6 |
| | Low friction type | CS1□Q | Double acting, Single rod | | |
| RSQ RSG | Stopper cylinder | RSQ | Double acting | | 10 |
| | | | Double acting with spring installed | | |
| | | | Single acting | | |
| | | RSG | Double acting | | |
| | | | Double acting with spring installed | | |
| | | | Single acting | | |
| CNA | Cylinder with lock | CNA | Double acting, Single rod | | 7 |

How to Order

CJ2
CM2

Standard model no. —XC3 A B

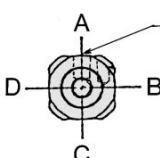
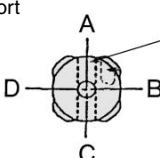
Special port location

• Cushion valve location seen from the rod
• Port location seen from the rod

* For port location, refer to the following diagrams and show the symbols of A, B, C and D.

Specifications: Same as standard type.

Relation between Port Location and Cushion Valve Location

| Series | Corresponding symbol of mounting bracket (Positional relationships) |
|------------|---|
| CJ2 CM2 | <div>  <p>Position relation between clevis and port</p> <p>* Viewed from the rod side, the ports are rendered A, B, C, and D, in the clockwise direction.</p> </div> <div>  <p>* Viewed from the rod side, with the clevis positioned as shown in the diagram, the ports are rendered A, B, C, and D, in the clockwise direction.</p> </div> |

1. Positional relationships between port and cushion valve can not be changed. 2. Cylinder with cushion of CJ2 (CJ2-A) is not available for -XC3.

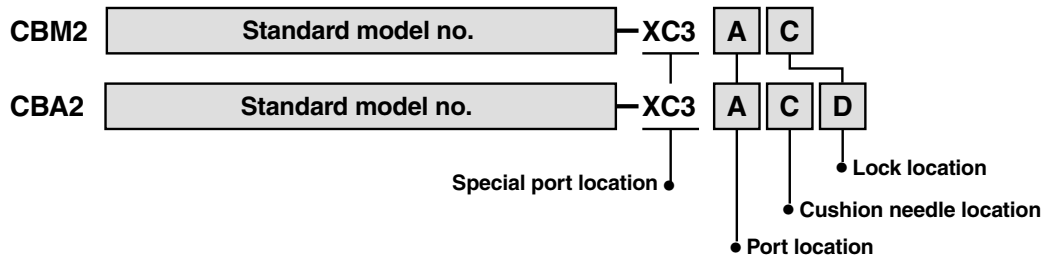
Made to Order Common Specifications: -XC3: Special Port Location

11 Special Port Location

Symbol

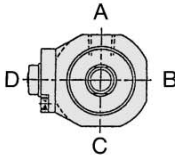
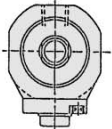
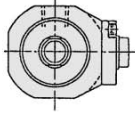
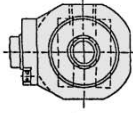
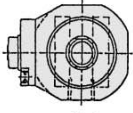
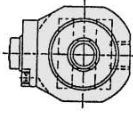
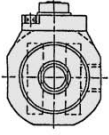
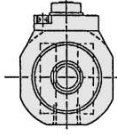
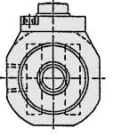
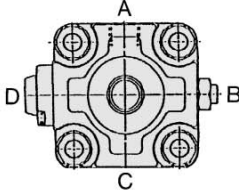
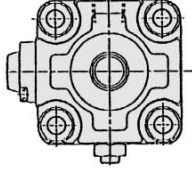
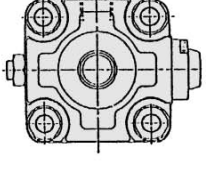
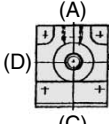
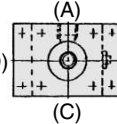
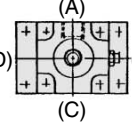
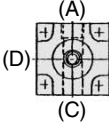
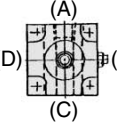
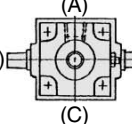
-XC3

How to Order



Specifications: Same as standard type.

Relation between Port Location and Cushion Valve Location

| Series | Corresponding symbol of mounting bracket (Positional relationships) | |
|--------|---|---|
| CBM | <p>Port location Rod side port and head side port are at the same location. Symbols of lock position and port location are as the following diagrams.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="text-align: center;">Standard (AD) AC AB</p> <p style="text-align: center;">Except with air cushion</p> | <p>Clevis style is based on the direction of clevis bracket.</p> <div style="display: grid; grid-template-columns: repeat(3, 1fr); gap: 10px;">       </div> <p style="text-align: center;">Standard (BA) AC BC</p> <p style="text-align: center;">Diagrams seen from the rod side</p> |
| CBA | <p>Port and cushion needle are at the same rod/head position. Symbols of port location, cushion needle position and lock position are as the following diagrams.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="text-align: center;">Standard (ABD) ACD ADB</p> | <p>When the mounting bracket is attached, the conditions placed like below are on a basis.</p> <div style="display: grid; grid-template-columns: repeat(3, 1fr); gap: 10px;">       </div> <p style="text-align: center;">Foot style Rod side flange style Head side flange style</p> <p style="text-align: center;">Single clevis style Double clevis style Center trunnion style</p> <p style="text-align: center;">Diagrams seen from the rod side</p> |

Made to Order Common Specifications: -XC4: With Heavy Duty Scraper

12 With Heavy Duty Scraper

Symbol

-XC4

It is suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-cast equipment, construction machinery, or industrial vehicles.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|---|--------|---------------------------|---|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | CM2W | Double acting, Double rod | | |
| | Centralized piping type | CM2□□P | Double acting, Single rod | | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | Head side locking type only (Except w/ air cushion) | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | | 6 |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | | 6 |
| | | CA2W | Double acting, Double rod | | |
| | Cylinder with end lock | CBA2 | Double acting, Single rod | Head side locking type only | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | | 6 |
| | | CS1W | Double acting, Double rod | | |
| C76 | Air cylinder | C76 | Double acting, Single rod | Refer to page 6-11-48. | 6 |
| | | C76W | Double acting, Double rod | Refer to page 6-11-48. | |
| C85 | ISO cylinder | C85 | Double acting, Single rod | Refer to page 6-11-49. | 6 |
| | | C85W | Double acting, Double rod | Refer to page 6-11-49. | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| CQ2 | Air cylinder | CQ2 | Double acting, Single rod | ø20 to ø100 | 7 |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | ø32 to ø100 | |
| | Long stroke | CQ2 | Double acting, Single rod | | |
| CV | Valve mounted cylinder | CV3 | Double acting, Single rod | | 10 |
| | | CVS1 | Double acting, Single rod | | |
| MGP | Compact guide cylinder | MGP | Double acting | ø20 to ø100 | 8 |
| | | MGPA | High precision type | ø20 to ø100 | |
| MGG | Guide cylinder | MGG | Standard type | Except ø20, ø25 | 8 |
| MGC | | MGC | Compact type | Except ø20, ø25 | 8 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

How to Order

Standard model no. —XC4

* For Series MGP and C95,
refer to page 6-17-44.

With heavy duty scraper
(SCB scraper)

Specifications: Same as standard type.

⚠ Caution

Do not replace heavy duty scrapers.

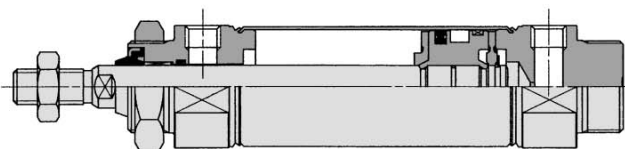
- Since a heavy duty scraper is press-fit, replace it by rod cover assembly, not a cover. (Holder plate assembly in the case of Series MGP)
- Series CM2 cannot replace either heavy duty scraper or rod seal.
(It goes for replacing retainer assembly for Series CS1.)

Made to Order Common Specifications: -XC4: With Heavy Duty Scraper

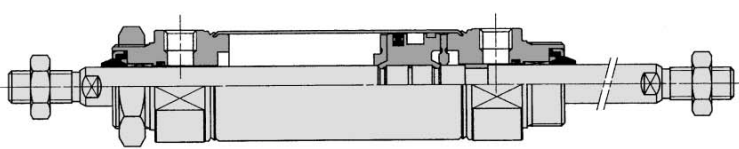
12 With Heavy Duty Scraper

Construction (Dimensions are the same as standard.)

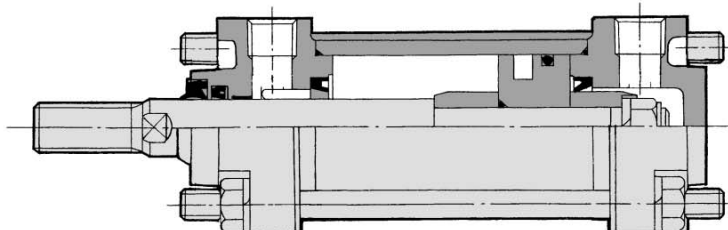
Series CM2



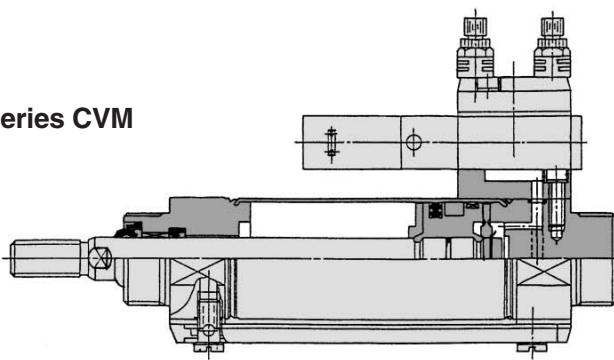
Series CM2W



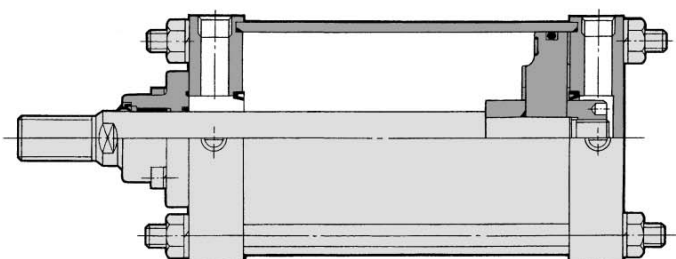
Series CA2



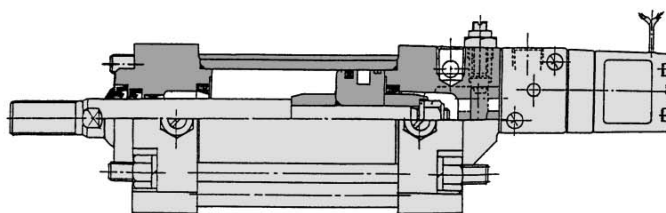
Series CVM



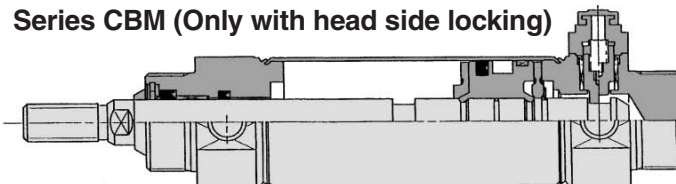
Series CS1



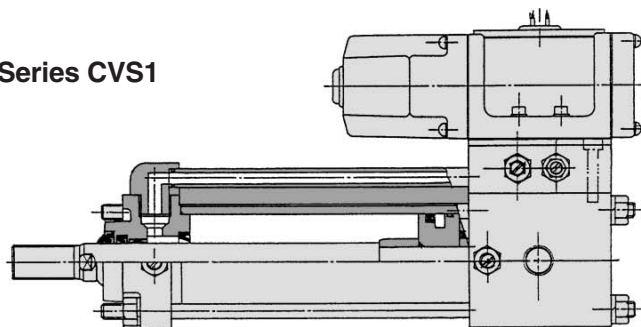
Series CV3



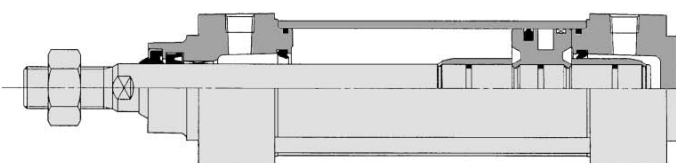
Series CBM (Only with head side locking)



Series CVS1



Series MB



Made to Order Common Specifications: -XC5: Heat Resistant Cylinder (70 to 110°C)

13 Heat Resistant Cylinder (–10 to 110°C)

Symbol

-XC5

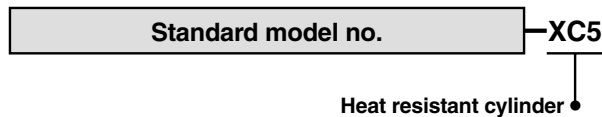
Cylinder which changed the seal material for heat resistance (up to 110°C) in order to use under the severe ambient temperature condition which exceeds the standard specifications of –10 to 70°C (0 to 70°C for Series CS1).

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|-------------------|-------|---------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | 6 |
| | | CM2W | Double acting, Double rod | |
| | Direct mount type | CM2R | Double acting, Single rod | |
| MB | Air cylinder | MB | Double acting, Single rod | 6 |
| | | MBW | Double acting, Double rod | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | 6 |
| | | MB1W | Double acting, Double rod | |
| CA2 | Air cylinder | CA1 | Double acting, Single rod | 6 |
| | | CA1W | Double acting, Double rod | |
| CS1* | Air cylinder | CS1 | Double acting, Single rod | 6 |
| | | CS1W | Double acting, Double rod | |

* Applicable bore size of Series CS1
Lube type: ø125 to ø300
Non-lube type: ø125 to 200

How to Order



Specifications

| | |
|---|---|
| Ambient temperature range | –10 to 110°C (0 to 110°C for Series CS1) |
| Seal material | Fluoro rubber (In the case of CS1 cylinder, cushion seal is made of NBR.) |
| With auto switch | Unavailable ⁽²⁾ |
| Specifications other than above and external dimensions | Same as standard type |



Note 1) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Note 2) Manufacturing built-in magnet type and the one with auto switch is impossible.

Note 3) Material of rod boot is heat resistant tarpaulin.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XC6: Piston Rod and Rod End Nut Made of Stainless Steel

12 Piston Rod and Rod End Nut Made of Stainless Steel

Suitable for the cases it is likely to generate rust by being immersed in the water and corrosion.

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|--|-------------|---|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod Single acting (Spring return/extend) | 6 |
| | | CM2W | Double acting, Double rod | |
| | Non-rotating rod type | CM2K | Double acting, Single rod Single acting (Spring return/extend) | |
| | | CM2KW | Double acting, Double rod | |
| | Direct mount type | CM2R | Double acting, Single rod | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | |
| | Centralized piping type | CM2□□P | Double acting, Single rod | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod Single acting (Spring return) | 6 |
| | Double rod type | CG1W | Double acting, Double rod | |
| | Direct mount type | CG1R | Double acting, Single rod | |
| | Low friction type | CG1□Q | Double acting, Single rod | |
| MB | Air cylinder | MB | Double acting, Single rod | 6 |
| | | MBW | Double acting, Double rod | |
| | Non-rotating rod type | MBK | Double acting, Single rod | |
| | Low friction type | MB□Q | Double acting, Single rod | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | 6 |
| | | MB1W | Double acting, Double rod | |
| | Non-rotating rod type | MB1K | Double acting, Single rod | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | 6 |
| | | CA2W | Double acting, Double rod | |
| | Cylinder with end lock | CBA2 (Note) | Double acting, Single rod | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | 6 |
| | | CS1W | Double acting, Double rod | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | 6 |
| CQS | Compact cylinder | CQS | Double acting, Single rod Single acting (Spring return/extend) | 7 |
| | | CQSW | Double acting, Double rod | |
| | Non-rotating rod type | CQSK | Double acting, Single rod | |
| | Lateral load resisting type | CQS□S | Double acting, Single rod | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod Single acting (Spring return/extend) | 7 |
| | | CQ2W | Double acting, Double rod | |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod Single acting (Spring return/extend) | |
| | Long stroke | CQ2 | Double acting, Single rod | |
| | Lateral load resisting type | CQ2□S | Double acting, Single rod | |
| CV | Valve mounted cylinder | CVM5 | Double acting, Single rod | 10 |
| | | CV3 | Double acting, Single rod | |
| | | CVS1 | Double acting, Single rod | |
| MGP | Compact guide cylinder | MGP | Double acting | 8 |
| MGG | Guide cylinder | MGG | Standard type | 8 |

Note) Head side locking type only

How to Order

CM2, CG1, MB, MB1, CA2, CS1,
CQS, CQ2, CV, CBA2

Standard model no.

XC6

Piston rod and rod end nut made of stainless steel

Specifications

| | |
|---|-------------------------|
| Parts changed to stainless steel | Piston rod, Rod end nut |
| Specifications other than above and external dimensions | Same as standard |



- Note 1) In the case of CS1 cylinder, the piston rod is only made of stainless steel. Rod end nut is not attached.
- Note 2) In the case of CQ cylinder, its snap ring and piston rod are made of stainless steel.
Rod end nut is also made of stainless steel for rod end male thread type.

Made to Order Common Specifications: -XC13: Auto Switch Rail Mounting Style

20 Auto Switch Rail Mounting Style

Symbol

-XC13

A cylinder on which a rail is mounted to enable auto switches, in addition to the standard method for mounting auto switches (Band mounting style).

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|-------------------------------------|-------|---------------------------|-------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | CM2W | Double acting, Double rod | | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | | |
| | | CM2KW | Double acting, Double rod | | |
| | Direct mount type | CM2R | Double acting, Single rod | | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | | 6 |
| | Double rod type | CG1W | Double acting, Double rod | | |
| | Non-rotating rod type | CG1K | Double acting, Single rod | | |
| | Direct mount type | CG1R | Double acting, Single rod | Except with air cushion | |
| MGG | Guide cylinder | MGG | Standard type | | 8 |
| MGC | | MGC | Compact type | | 8 |

How to Order

CDM2 **Standard model no.** — XC13A

CDG1 **Standard model no.** — XC13A

Rail mounting direction

| | |
|---------------|---|
| XC13A | Mounted on the right side when viewed from the rod with the ports facing upwards. |
| XC13B | Mounted on the left side when viewed from the rod. |
| XC13C* | Mounted on the underside when viewed from the rod. |

* Not available for CDG1.



Specifications

| | | |
|----------------------------|--------------------|--|
| Rail mounting style | Reed switch | D-A7/A8, D-A7□H/A80H, D-A73C/A80C, D-A79W |
| | Solid state switch | D-F7□, D-F7□V, D-F7BA, D-F79F, D-F79W, D-F7□WV, D-J79, D-J79C, D-J79W |
| Additional specifications | | Same as standard type |
| Auto switch specifications | | For detailed specifications about an auto switch for itself, refer to page 6-16-1. |

* Trunnion style of the Series CDG1 cannot be mounted.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

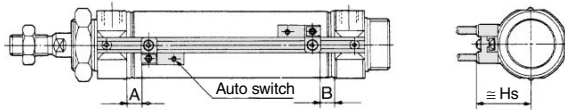
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Made to Order Common Specifications: -XC13: Auto Switch Rail Mounting Style

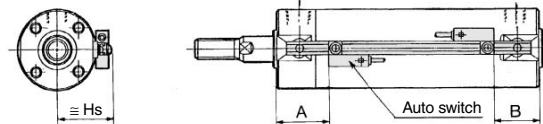
21 Auto Switch Rail Mounting Style

Dimensions

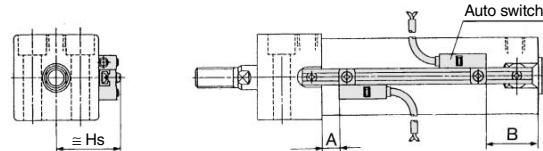
Series CDM2



Series CDG1



Series CDG1R



Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

| Cylinder series | Bore size (mm) | D-A7/A8 | | | | D-A79W | | D-F79F | | D-A7/A8, D-J79W, D-A80H, D-F7BA, D-F79F, D-F79C, D-F79V, D-F79W, D-F79T, D-F79W | | | | | |
|-----------------|----------------|-------------|---------|-------------|-------------|-------------|-------------|-------------|-------------|---|------|------|------|------|------|
| | | A | B | A | B | A | B | A | B | Hs | Hs | Hs | Hs | Hs | Hs |
| CDM2 | 20 | 7.5 | 6.5 | 8 | 7 | 5 | 4 | 12 | 11 | 22.5 | 23.5 | 29.5 | 26 | 29 | 25 |
| | 25 | 7.5 | 6.5 | 8 | 7 | 5 | 4 | 12 | 11 | 25.5 | 26.5 | 32.5 | 29 | 32 | 28 |
| | 32 | 8.5 | 7.5 | 9 | 8 | 6 | 5 | 13 | 12 | 29 | 30 | 36 | 32.5 | 35.5 | 31.5 |
| | 40 | 13.5 | 12.5 | 14 | 13 | 11 | 10 | 18 | 17 | 33 | 34 | 40 | 36.5 | 39.5 | 35.5 |
| CDG1 CDG1R | 20 | 30.5 [9.5] | 21 (29) | 31 [10] | 21.5 (29.5) | 28 [7] | 18.5 (26.5) | 35 [14] | 25.5 (33.5) | 25.5 | 26.5 | 32.5 | 29 | 32 | 28 |
| | 25 | 30.5 [9.5] | 21 (29) | 31 [10] | 21.5 (29.5) | 28 [7] | 18.5 (26.5) | 35 [14] | 25.5 (33.5) | 28 | 29 | 35 | 31.5 | 34.5 | 30.5 |
| | 32 | 31.5 [10.5] | 22 (30) | 32 [11] | 22.5 (30.5) | 29 [8] | 19.5 (27.5) | 36 [15] | 26.5 (34.5) | 31.5 | 32.5 | 38.5 | 35 | 38 | 34 |
| | 40 | 36 [15] | 24 (33) | 36.5 [15.5] | 24.5 (33.5) | 33.5 [12.5] | 21.5 (30.5) | 40.5 [19.5] | 28.5 (37.5) | 35.5 | 36.5 | 42.5 | 39 | 42 | 38 |
| | 50 | 43.5 [17.5] | 29 (41) | 44 [18] | 29.5 (41.5) | 41 [15] | 26.5 (38.5) | 48 [22] | 33.5 (45.5) | 41 | 42 | 48 | 44.5 | 47.5 | 43.5 |
| | 63 | 43.5 [17.5] | 29 (41) | 44 [18] | 29.5 (41.5) | 41 [15] | 26.5 (38.5) | 48 [22] | 33.5 (45.5) | 48 | 49 | 55 | 51.5 | 54.5 | 50.5 |

[]: Denotes the locations for CDG1R.

(): Denotes the value of long strokes.

* For the dimensions other than the proper auto switch mounting position and its mounting height, refer to standard type for each series.

Made to Order Common Specifications: -XC18: NPT Finish Piping Port

23 NPT Finish Piping Port

Symbol

-XC18

Air cylinder which piping port Rc threads were changed to NPT threads.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|---------------------------------------|---------------------|--------------------------------------|---------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | | Single acting (Spring return/extend) | | |
| | Non-rotating rod type | CM2W | Double acting, Double rod | | |
| | | CM2K | Double acting, Single rod | | |
| | | CM2KW | Single acting (Spring return/extend) | | |
| CG1 | Air cylinder | CG1 | Double acting | | 6 |
| | | | Single acting (Spring return/extend) | | |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| | Non-rotating rod type | MBK | Double acting, Single rod | | |
| | Low friction type | MB□Q | Double acting, Single rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| | Non-rotating rod type | MB1K | Double acting, Single rod | | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | | 6 |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| CU | Free mount cylinder | CU | Double acting, Single rod | Applicable to ø32 only | 7 |
| | | | Single acting (Spring return/extend) | Applicable to ø32 only | |
| | Non-rotating rod type | CUK | Double acting, Single rod | Applicable to ø32 only | |
| | | | Single acting (Spring return/extend) | Applicable to ø32 only | |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | Applicable to ø32 to 100 | 7 |
| | | | Single acting (Spring return/extend) | Applicable to ø32 to 50 | |
| | Non-rotating rod type | CQ2W | Double acting, Double rod | Applicable to ø32 to 100 | |
| | | | Double acting, Single rod | Applicable to ø32 to 63 | |
| | Large bore size | CQ2 (125, 140, 160) | Double acting, Single rod | | |
| | | | Double acting, Double rod | | |
| RSQ | Stopper cylinder | RSQ | Double acting | | 10 |
| | | | Double acting with spring type | | |
| | | | Single acting | | |
| CL | Locked-up cylinder | CL1 | Double acting, Single rod | Applicable to ø125 to 160 | 9 |
| CXW | Slide unit | CXWM | Slide bearing | Applicable to ø25, ø32 | 8 |
| | | CXWL | Ball bushing bearing | Applicable to ø25, ø32 | |
| MGQ | Compact guide cylinder | MGQ | Double acting | | 8 |
| MGG | Guide cylinder | MGG | Standard type | | 8 |
| MGC | | MGC | Compact type | | 8 |
| CY1 | Magnetic rodless cylinder | CY1B | Basic type | | 8 |
| | | CY1S | Slide bearing | | |
| MY1 | Mechanically jointed rodless cylinder | MY1B | Double acting | Applicable to ø25 to 100 | 8 |
| | | MY1M | Double acting | Applicable to ø25 to 63 | |
| | | MY1C | Double acting | Applicable to ø25 to 63 | |
| | | MY1H | Double acting | Applicable to ø25 to 40 | |
| | | MY1HT | Double acting | Applicable to ø50, ø63 | |
| CE2 | Stroke reading cylinder | CE2 | Double acting, Single rod | | 10 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

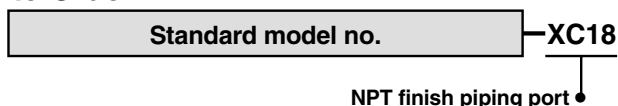
Made to Order Common Specifications: -XC18: NPT Finish Piping Port

23 NPT Finish Piping Port

Symbol

-XC18

How to Order



Specifications: Same as standard type.

Dimensions (Connection port size) (Dimensions other than below are the same as standard type.)

Series CS1

| Bore size (mm) | Port size |
|----------------|-----------|
| 125 | NPT 1/2 |
| 140 | |
| 160 | |
| 180 | NPT 3/4 |
| 200 | |
| 250 | |
| 300 | NPT 1 |

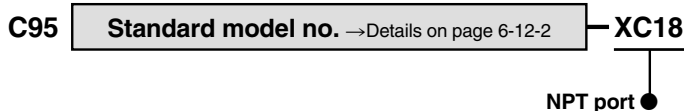
Series MB, Series MB1

| Bore size (mm) | Port size |
|----------------|-----------|
| 32 | NPT 1/2 |
| 40, 50 | NPT 3/4 |
| 63, 80 | NPT 3/8 |
| 100 | NPT 1/2 |

Series MGG

| Bore size (mm) | Port size |
|----------------|-----------|
| 20 | NPT 1/8 |
| 25 | |
| 32 | |
| 40 | |
| 50 | NPT 1/4 |
| 63 | |
| 80 | NPT 3/8 |
| 100 | NPT 1/2 |

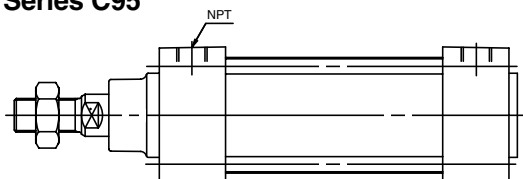
How to Order



Specifications

| | |
|---------------------|---------------------------------------|
| Applicable cylinder | Air cylinder/Standard |
| Series | C95 |
| Action | Double acting/Single rod |
| Bore size(mm) | 32, 40, 50, 63, 80, 100 |
| Cushion | Air cushion |
| Auto switch | Available for mounting |
| Mounting | Basic, Foot, Flange, Clevis, Trunnion |

Series C95



| Bore size (mm) | Port size |
|----------------|-----------|
| 32 | NPT 1/8 |
| 40/50 | NPT 1/4 |
| 63/80 | NPT 3/8 |
| 100 | NPT 1/2 |

Made to Order Common Specifications: -XC18: NPT Finish Piping Port

23 NPT Finish Piping Port

Symbol

-XC18

Dimensions (Connection port size) (Dimensions other than below are the same as standard type.)

Series MGC

| Bore size (mm) | Port size |
|----------------|-----------|
| 32 | NPT 1/8 |
| 40 | |
| 50 | NPT 1/4 |

Series CXW

| Bore size (mm) | Port size |
|----------------|-----------|
| 25 | NPT 1/8 |
| 32 | |

Series CE2

| Bore size (mm) | Port size |
|----------------|-----------|
| 40 | NPT 1/4 |
| 50 | NPT 3/8 |
| 63 | |
| 80 | NPT 1/2 |
| 100 | |

Series CU

| Bore size (mm) | Port size |
|----------------|-----------|
| 32 | NPT 1/8 |

Series CQ2

| Bore size (mm) | Port size |
|------------------------|-----------|
| 32, 40 | NPT 1/8 |
| 50, 63 | NPT 1/4 |
| 80, 100, 125, 140, 160 | NPT 3/8 |

Note) In the case of bore size 32 without auto switch, stroke availability begins with 10 stroke.

Series CM2, CG1

| Bore size (mm) | Series CM2 | Series CG1 | | |
|-------------------|------------|---------------|-------------|--|
| | | Rubber bumper | Air cushion | |
| 20 | NPT 1/8 | NPT 1/8 | No10-32 UNF | |
| 25 | | | NPT 1/8 | |
| 32 | | | | |
| 40 | NPT 1/4 | — | NPT 1/4 | |
| 50 | — | | NPT 1/4 | |
| 63 | | | | |
| 80 | | | NPT 3/8 | |
| 100 | | | NPT 1/2 | |

Series RSQ

| Bore size (mm) | Port size |
|----------------|-----------|
| 20 | NPT 1/8 |
| 32 | |
| 40 | |
| 50 | |

Series CY

| Bore size (mm) | Port size |
|----------------|-----------|
| 20 | NPT 1/8 |
| 25 | |
| 32 | |
| 40 | NPT 1/4 |
| 50 | NPT 1/4 |
| 63 | NPT 1/4 |

Series MGQ

| Bore size (mm) | Port size |
|----------------|-----------|
| 20 | NPT 1/8 |
| 25 | |
| 32 | |
| 40 | |
| 50 | NPT 1/4 |
| 63 | NPT 3/8 |
| 80 | |
| 100 | |

Series MY1

| Bore size (mm) | Port size |
|----------------|-----------|
| 25 | NPT 1/8 |
| 32 | |
| 40 | NPT 1/4 |
| 50 | NPT 3/8 |
| 63 | |
| 80 | NPT 1/2 |
| 100 | |

* Bottom ported is the same as standard type.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XC20: Head Cover Axial Port

25 Head Cover Axial Port

Symbol

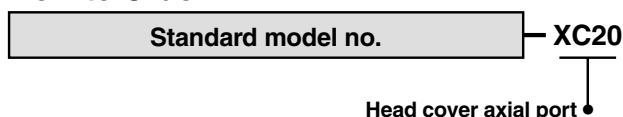
-XC20

Head side port position is changed to the axial direction. (Standard head side port is plugged with hexagon socket head screw.)

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|-------------------------------------|-------|--------------------------------------|-------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | Except with air cushion | 6 |
| | | | Single acting (Spring return/extend) | | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | Except with air cushion | |
| | | | Single acting (Spring return/extend) | | |
| | Direct mount type | CM2R | Double acting, Single rod | Except with air cushion | |
| CG1 | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | Except with air cushion | 6 |
| | Air cylinder | CG1 | Double acting, Single rod | Except with air cushion | |
| | | | Double acting, Single rod | Except with air cushion | |
| | Direct mount type | CG1R | Double acting, Single rod | Except with air cushion | |
| CG1 | Non-rotating rod, Direct mount type | CG1KR | Double acting, Single rod | Except with air cushion | |

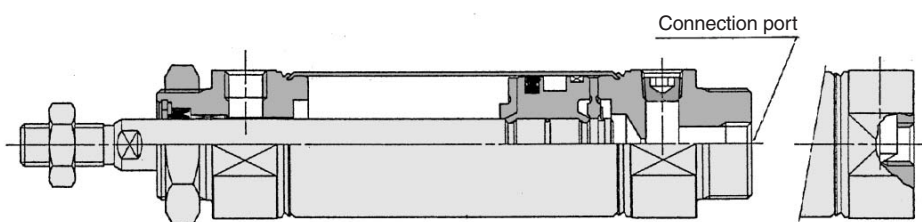
How to Order



Specifications: Same as standard type.

* Be sure to use the speed controller since head side port has no throttle.

Construction



Series CM2

| Bore size (mm) | Port size |
|----------------|-----------|
| 20, 25, 32 | Rc 1/8 |
| 40 | Rc 1/4 |

Series CG1

| Bore size (mm) | Port size |
|----------------|-----------|
| 20, 25, 32, 40 | Rc 1/8 |
| 50, 63 | Rc 1/4 |

* Same dimensions as standard type except port size

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XC22: Fluoro Rubber Seals

26 Fluoro Rubber Seals

Symbol

-XC22

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|--|-----------|--------------------------------------|-------------------------|--------------------------|
| CJP | Pin cylinder | CJP | Double acting, Single rod | | 6 |
| | | CJPB | Single acting (Panel mounting) | | |
| | | CJPS | Single acting (Embedded) | Except with air cushion | |
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | | 6 |
| | | | Single acting (Spring return/extend) | Except with air cushion | |
| | | CJ2W | Double acting, Double rod | | |
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | CM2W | Double acting, Double rod | | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | | |
| | | CM2KW | Double acting, Double rod | | |
| | Direct mount type | CM2R | Double acting, Single rod | | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | | |
| | End lock cylinder | CBM2 | Double acting, Single rod | | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | | 6 ⁽⁵⁾ |
| | Double rod type | CG1W | Double acting, Double rod | | |
| | Direct mount type | CG1R | Double acting, Single rod | | |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | | 6 |
| | | CA2W | Double acting, Double rod | | |
| | End lock cylinder | CBA1 | Double acting, Single rod | | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| CP95 | ISO cylinder | CP95S | Double acting, Single rod | | 6 |
| | | C95S□□-□W | Double acting, Double rod | | |
| CU | Free mount cylinder | CU | Double acting, Single rod | | 7 |
| | | | Single acting (Spring return/extend) | | |
| | Non-rotating rod type | CUK | Double acting, Single rod | | |
| | | | Single acting (Spring return/extend) | | |
| MGP | Compact guide cylinder | MGPM | Double acting | Sliding bearing only | 8 |
| MGQ | | MGQM | Double acting | Sliding bearing only | 8 |
| MGG | Guide cylinder | MGG | Standard type | | 8 |
| MGC | | MGC | Compact type | | 8 |
| CV | Valve mounted cylinder | CV3 | Double acting, Single rod | | 10 |
| | | CVS1 | Double acting, Single rod | | |
| CEP1 | High precision stroke reading cylinder | CEP1 | Double acting, Single rod | | 10 |

Made to Order Common Specifications: -XC22: Fluoro Rubber Seals

26 Fluoro Rubber Seals

Symbol

-XC22

How to Order

| | |
|--------------------|-----------------------|
| Standard model no. | -XC22 |
| | Fluoro rubber seals ● |

Specifications

| | |
|---|--|
| Seal material | Fluoro rubber |
| Ambient temperature range | With auto switch : -10 to 70°C (No freezing) ⁽¹⁾ Without auto switch : -10 to 60°C (No freezing) |
| Specifications other than above and external dimensions | Same as standard type for each series |



Note 1) Please confirm with SMC, as the type of chemical and the operating temperature may not allow the use of this product.

Note 2) Cylinders with auto switches can also be produced; however, auto switch related parts (auto switch units, mounting brackets, built-in magnets) are the same as standard products. Before using these, please contact SMC regarding their suitability for the operating environment.

Note 3) It is only applicable for the cylinder main body section as to Series CV3, CVS1.

Note 4) Series MGG is using a shock absorber RBL type.

Note 5) No cushion is equipped for N type.

How to Order

| | | |
|-------------|---|-------------------------|
| C95 CP95 | Standard model no. → Details on pages 6-12-2 and 6-13-4 | -XC22 |
| | | Fluorine rubber seals ● |

Specifications

| | |
|---------------------|--|
| Applicable cylinder | Air cylinder/Standard |
| Series | C95/CP95 |
| Action | Double acting/Single rod Double acting/Double rod |
| Bore size(mm) | 32, 40, 50, 63, 80, 100 |
| Cushion | Air cushion |
| Auto switch | Available for mounting |
| Mounting | Basic, Foot, Flange, Clevis, Trunnion |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications:

- XC24: With Magnetic Shielding Plate
- XC25: No Fixed Throttle of Connection Port

27 With Magnetic Shielding Plate -XC24

Shields against the magnetic leaked from external slider.

Applicable Series

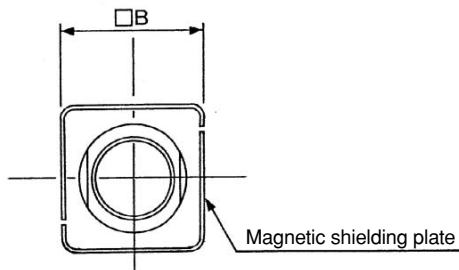
| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|---------------------------------------|-------|-------------|--------------------------|
| CY1 | Magnetically coupled rodless cylinder | CY1B | Basic style | 8 |
| REA | Sine rodless cylinder | REA | Basic style | 10 |

How to Order

CY1B
REA Standard model no. -XC24
With magnetic shielding plate

Specifications: Same as standard type.

Dimensions



| Dimensions | Bore size (mm) | | | | | | | |
|-----------------------|----------------|----|----|----|----|----|----|----|
| | 6 | 10 | 15 | 20 | 25 | 32 | 40 | 50 |
| B | 19 | 27 | 37 | 38 | 48 | 62 | 72 | 88 |
| Standard external (B) | 17 | 25 | 35 | 36 | 46 | 60 | 70 | 86 |

* Dimensions except mentioned above are the same as standard type.
* REA is 25 to 63.

28 No Fixed Orifice of Connection Port -XC25

Type with no restrictor on the port, since it's using air-hydro type on the rod cover and the head cover of air cylinder Series CM2.

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|-------------------|-------|--------------------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | 6 |
| | | | Single acting (Spring return/extend) | |
| | Direct mount type | CM2W | Double acting, Double rod | |
| | | CM2R | Double acting, Single rod | |

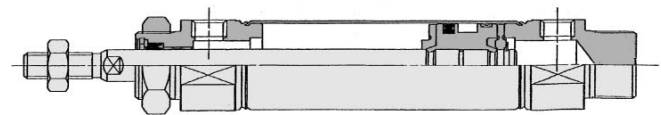
Except with air cushion

How to Order

CM2 Standard model no. -XC25
No fixed Throttle in connection port

Specifications: Same as standard type.

Construction



* External dimensions are the same as standard CM2 series.

⚠ Caution

1. Use a shock absorber, etc.

When the piston speed exceed 750 mm/s, make sure that direct impact does not apply on the cylinder cover by using an external stopper (shock absorber, etc).

Made to Order Common Specifications: -XC27: Double Clevis Pin and Double Knuckle Pin Made of Stainless Steel (SUS304)

29 Double Clevis Pin and Knuckle Pin Made of Stainless Steel

Symbol

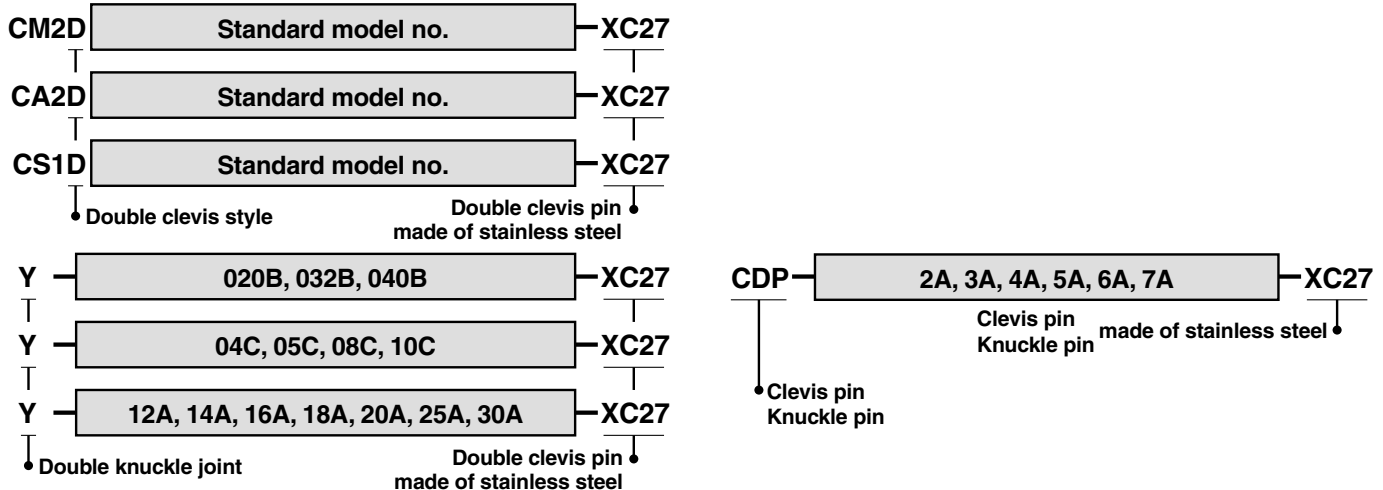
-XC27

To prevent the oscillating portion of the double clevis or the double knuckle joint from rusting, the material of the pin and the snap ring (split pin) has been changed to stainless steel.

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|------------------------|-------|--------------------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | 6 |
| | | | Single acting (Spring return/extend) | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | |
| | | | Single acting (Spring return/extend) | |
| MB | Air cylinder | MB | Double acting, Single rod | 6 |
| | | MBW | Double acting, Double rod | |
| | Non-rotating rod type | MBK | Double acting, Single rod | |
| | Low friction type | MBQ | Double acting, Single rod | |
| | Cylinder with end lock | MBB | Double acting, Single rod | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | 6 |
| | | MB1W | Double acting, Double rod | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | 6 |
| | Non-rotating rod | CA2K | Double acting, Single rod | |
| | Cylinder with end lock | CBA2 | Double acting, Single rod | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | 6 |
| CV | Valve mounted cylinder | CVS1 | Double acting, Single rod | 10 |
| | | CVS1K | Double acting, Single rod | |

How to Order

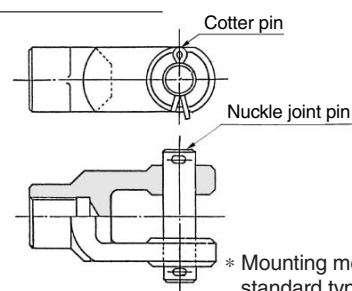


Specifications

| | |
|---------------------------------|------------------------------|
| Mounting style | Only double clevis style (D) |
| Pin material | Stainless steel 304 |
| Specifications other than above | Same as standard type |

Dimensions: Same as Standard Type

* For mounting bracket, cotter pin, clevis pin and knuckle joint pin are shipped together.



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XC29: Double Knuckle Joint with Spring Pin

31 Double Knuckle Joint with Spring Pin

Symbol

-XC29

To prevent loosening of the double knuckle joint of standard air cylinder (Series CM2/CA2)

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|-------------------------------------|--------|--------------------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | 6 |
| | | | Single acting (Spring return/extend) | |
| | Non-rotating rod type | CM2W | Double acting, Double rod | |
| | | CM2K | Double acting, Single rod | |
| | | | Single acting (Spring return/extend) | |
| | | CM2KW | Double acting, Double rod | |
| | Direct mount type | CM2R | Double acting, Single rod | |
| | Non-rotating rod, Direct mount type | CM2RK | Double acting, Single rod | |
| | Centralized piping type | CM2□□P | Double acting, Single rod | |

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|------------------------|-------|---------------------------|--------------------------|
| CG1 | Air cylinder | CG1 | Double acting, Single rod | 6 |
| | | MB | Double acting, Single rod | |
| MB | Air cylinder | MBW | Double acting, Double rod | 6 |
| | | MBK | Double acting, Single rod | |
| | | MBQ | Double acting, Single rod | |
| | | MBB | Double acting, Single rod | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | 6 |
| | | MB1W | Double acting, Double rod | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | 6 |
| | | CBA2 | Double acting, Single rod | |
| CV | Valve mounted cylinder | CV3 | Double acting, Single rod | 10 |
| | | CVS1 | Double acting, Single rod | |

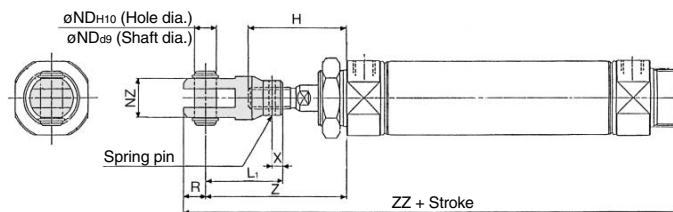
How to Order

Standard model no. **-XC29**
Double knuckle joint with spring pin

Specifications: Same as standard type.

Dimensions (For mounting bracket, pin is shipped together.)

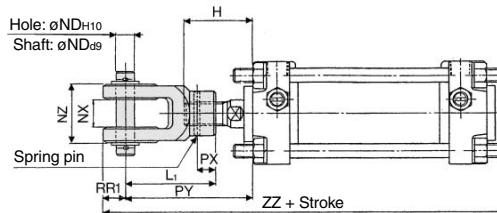
Series CM2



| Bore size (mm) | H | L1 | NDH10 | NZ | R | Z | ZZ | Spring pin |
|----------------|----|----|-----------------------------------|----|----|----|-----|------------|
| 20 | 41 | 36 | 9 ^{+0.058} ₀ | 18 | 10 | 61 | 146 | ø3 x 16ℓ |
| 25 | 45 | 38 | 9 ^{+0.058} ₀ | 18 | 10 | 65 | 150 | ø3 x 16ℓ |
| 32 | 45 | 38 | 9 ^{+0.058} ₀ | 18 | 10 | 65 | 152 | ø3 x 16ℓ |
| 40 | 50 | 55 | 12 ^{+0.070} ₀ | 38 | 13 | 83 | 200 | ø4 x 24ℓ |

* Other dimensions are the same as standard type.

Series CA2 (CBA2, CV3, CVS1)



| Bore size (mm) | H | L1 | PX | PY | ZZ | RR1 | øND | H10 | d9 | NX | NZ | Spring pin |
|----------------|----|----|----|-----|-----|-----|-----|-------------|------------------|------------------------------------|----|------------|
| 40 | 51 | 55 | 11 | 84 | 192 | 13 | 12 | +0.070 0 | -0.050 -0.093 | 16 ^{+0.3} _{+0.1} | 38 | ø4 x 24ℓ |
| 50 | 58 | 60 | 12 | 91 | 207 | 15 | 12 | +0.070 0 | -0.050 -0.093 | 16 ^{+0.3} _{+0.1} | 38 | ø4 x 25ℓ |
| 63 | 58 | 60 | 12 | 91 | 218 | 15 | 12 | +0.070 0 | -0.050 -0.093 | 16 ^{+0.3} _{+0.1} | 38 | ø4 x 25ℓ |
| 80 | 71 | 71 | 16 | 105 | 257 | 19 | 18 | +0.070 0 | -0.050 -0.093 | 28 ^{+0.3} _{+0.1} | 55 | ø4 x 36ℓ |
| 100 | 72 | 83 | 16 | 118 | 282 | 21 | 20 | +0.084 0 | -0.065 -0.117 | 30 ^{+0.3} _{+0.1} | 61 | ø4 x 40ℓ |

* Dimensions except mentioned above are the same as standard type.

Made to Order Common Specifications: -XC35: With Coil Scraper

34 With Coil Scraper

Symbol

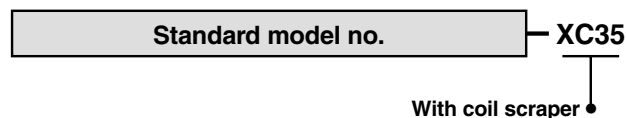
-XC35

It gets rid of frost, ice, weld spatter, cutting chips adhered to the piston rod, and protects the seals, etc.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|------------------------|-------|---------------------------|--|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | Except with air cushion | 6 |
| | | CM2W | Double acting, Double rod | Except with air cushion | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | Lock in head end only (Except with air cushion) | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | | 6 |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | | 6 |
| | | CA2W | Double acting, Double rod | | |
| | Cylinder with end lock | CBA2 | Double acting, Single rod | | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | | 6 |
| | | CS1W | Double acting, Double rod | | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| CQ2 | Compact cylinder | CQ2 | Double acting, Single rod | Applicable to ø32 to ø100. Except the one with bracket | 7 |
| | | CQ2W | Double acting, Double rod | Applicable to ø32 to ø100. Except the one with bracket | |
| MNB | Cylinder with lock | MNB | Double acting, Single rod | | 9 |
| CNA | Cylinder with lock | CNA | Double acting, Single rod | | 9 |
| CV | Valve mounted cylinder | CVS1 | Double acting, Single rod | | 10 |
| MGP | Compact guide cylinder | MGP | Double acting | Applicable to ø20 to ø100. | 8 |
| | | MGPA | High precision type | Applicable to ø20 to ø100. | |
| MGG | Guide cylinder | MGG | Standard type | Except ø20, ø25 | 8 |

How to Order



* For Series C95, refer to page 6-17-92. For Series MGP, refer to page 6-17-94.

Specifications: Same as standard type.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications:

-XC51: With Hose Nipple

-XC52: Mounting Nut with Set Screw

39 With Hose Nipple

Symbol

-XC51

The one with hose nipple attached in order to save time for assembly at the time of shipment.

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|-------------------------------------|-------|---------------------------------------|--------------------------|
| CJ2 | Air cylinder | CJ2 | Double acting, Single rod | 6 |
| | | | Single acting (Spring return/extend) | |
| | | CJ2W | Double acting, Double rod | |
| | Non-rotating rod type | CJ2K | Double acting, Single rod | |
| | | | Single acting (Spring return/extend) | |
| | With speed controller | CJ2Z | Double acting, Single rod | |
| | | | Double acting, Double rod | |
| | Low friction type | CJ2□Q | Double acting, Single rod | |
| | | | Double acting, Single rod | |
| | Direct mount type | CJ2RA | Double acting, Single rod | |
| | | | Single acting, (Spring return/extend) | |
| | Non-rotating rod, Direct mount type | CJ2RK | Double acting, Single rod | |
| | | | Single acting, (Spring return/extend) | |

40 Mounting Nut with Set Screw

Symbol

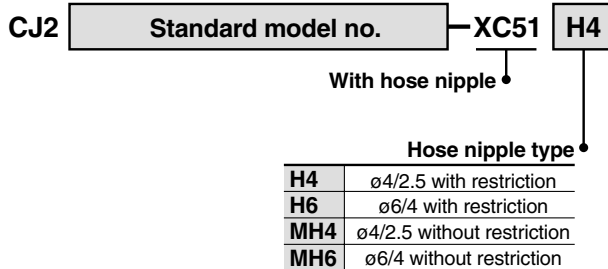
-XC52

In order to prevent the mounting nut from being loosen, set screw should be tighten from the two directions to fix the mounting nut.

Applicable Series

| Series | Description | Model | Action | Vol. no. (for std model) |
|--------|-------------------------|-------|--------------------------------------|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | 6 |
| | | | Single acting (Spring return/extend) | |
| | | CM2W | Double acting, Double rod | |
| | Non-rotating rod type | CM2K | Double acting, Single rod | |
| | | | Single acting (Spring return/extend) | |
| | Centralized piping type | CM2KW | Double acting, Double rod | |
| | | | Double acting, Single rod | |

How to Order



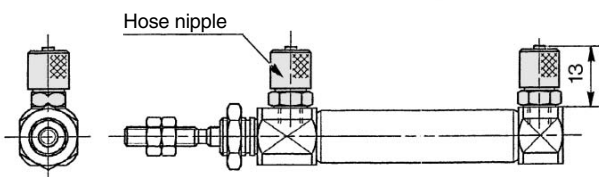
Specifications: Same as standard type.

Applicable Hose Nipple Type

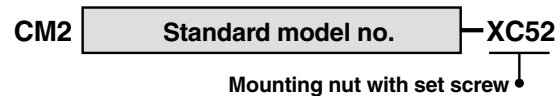
| Symbol | Applicable bore size (mm) | Function | Hose nipple part no. |
|--------|---------------------------|-----------------------------|----------------------|
| H4 | 4/2.5 | With a fixed orifice (ø0.8) | CJ-5H-4 |
| H6 | 6/4 | | CJ-5H-6 |
| MH4 | 4/2.5 | Without fixed orifice | M-5H-4 |
| MH6 | 6/4 | | M-5H-6 |

Dimensions

(Dimensions other than below are the same as standard type.)



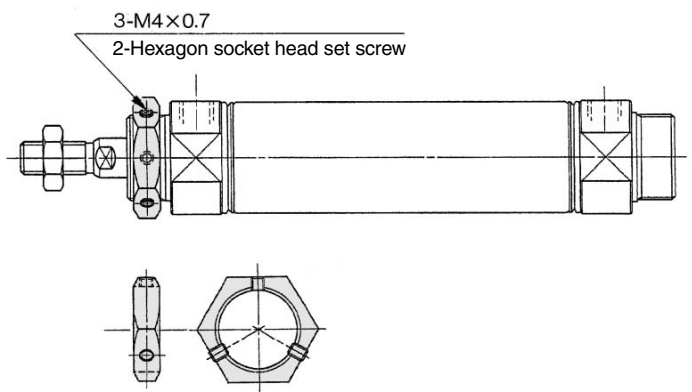
How to Order



Specifications: Same as standard type.

Dimensions

(Dimensions other than below are the same as standard type.)



Air Cylinder: Standard Type Double Acting, Double Rod Series **CM2W** ø20, ø25, ø32, ø40

How to Order

Mounting style

| | |
|---|------------------|
| B | Basic style |
| L | Axial foot style |
| F | Flange style |
| U | Trunnion style |

Type

| | |
|-----|-----------|
| Nil | Pneumatic |
| H | Air-hydro |

Piping

| | |
|-----|-----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fittings |

* Air-hydro cylinder: Screw-in type only

Cushion

| | |
|-----|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

* Air-hydro cylinder: Rubber bumper only

Rod boot

| | |
|-----|--------------------------------------|
| Nil | None |
| J | Nylon tarpaulin (One end) |
| JJ | Nylon tarpaulin (Both ends) |
| K | Heat resistant tarpaulin (One end) |
| KK | Heat resistant tarpaulin (Both ends) |

Without auto switch
CM2W **H** **L** **40** **F** — **150** **A** **J**

With auto switch
CDM2W **H** **L** **40** **F** — **150** **A** **J** — **H7BW**

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Stroke (mm)
(Refer to "Standard Stroke" on page 6-4-26.)

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | | |
|--|--|------------------|-----------------|--------------------------------------|--------------|---|-------------------|------------------------|------------|-------|----------|--------------------|-----------------|------------|------------|---|---|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | | |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | | |
| | | | | | | | 100 V, 200 V | B54 ** | ● | ● | ● | — | — | | | | |
| | | | | | | | — | C73C | ● | ● | ● | ● | — | | | | |
| | | | | | | | — | A33A ** | — | — | — | ● | — | | | | |
| | 100 V, 200 V | A34A ** | | — | — | — | ● | — | | | | | | | | | |
| | DIN terminal | A44A ** | | — | — | — | ● | — | Relay, PLC | | | | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | | — | | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | |
| | | 3-wire (PNP) | | 12 V | | H7A2 | | ● | ● | ○ | — | ○ | | | | | |
| | | Connector | | 2-wire | | 12 V | | H7B | ● | ● | ○ | — | ○ | | | | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | | H7C | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 2-wire | 12 V | G39A ** | | — | — | — | ● | — | — | IC circuit | | | |
| | | | | 3-wire (NPN) | 5 V, 12 V | K39A ** | | — | — | — | ● | — | — | | | | |
| | | | | 3-wire (PNP) | 5 V, 12 V | H7NW | | ● | ● | ○ | — | ○ | IC circuit | | | | |
| | | | | Water resistant (2-color indication) | 2-wire | 12 V | | H7PW | ● | ● | ○ | — | ○ | — | | | |
| | | | | | | With diagnostic output (2-color indication) | | 3-wire (NPN) | 5 V, 12 V | H7BW | ● | ● | ○ | | | — | ○ |
| | | | | | | | | | 12 V | H7BA | — | ● | ○ | | | — | ○ |
| | | | | | | | | 3-wire (NPN) | 5 V, 12 V | H7NF | ● | ● | ○ | | | — | ○ |

- * Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN
- * Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
** D-A3□A/A44A/G39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.
- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
• For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2W



Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Action | Double acting, Double rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.08 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $^{+1.4}_0$ mm | | | |
| Piston speed | 50 to 750 mm/s | | | |
| Cushion | Rubber bumper | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

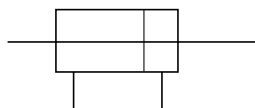
| Bore size (mm) | Standard stroke ⁽¹⁾ (mm) | Maximum stroke (mm) |
|----------------|--|---------------------|
| 20 | 25, 50, 75, 100, 125, 150 200, 250, 300 | 500 |
| 25 | | |
| 32 | | |
| 40 | | |



Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

JIS Symbol
Double acting



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB7 | Cold resistant cylinder |
| -XB12 | External stainless steel cylinder |
| -XC3 | Special port location |
| -XC4 | With heavy duty scraper |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC22 | Fluoro rubber seals |
| -XC25 | No fixed orifice of connecting port |
| -XC29 | Double knuckle joint with spring pin |
| -XC35 | With coil scraper |
| -XC38 | Vacuum (Rod through-hole) |
| -XC52 | Mounting nut with set screw |

Accessory Bracket

For mounting brackets, refer to pages 6-4-21 to 6-4-22.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |

* Two foot brackets and a mounting nut are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|--------------------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A D-A44A D-G39A D-K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| | | |
| J JJ | Nylon tarpaulin | 70°C |
| K KK | Heat resistant tarpaulin | 110°C * |

* Maximum ambient temperature for the rod boot itself.



Mounting screws set made of stainless steel. The following stainless steel mounting screw kit is available and may be used depending on the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Mounting Style and Accessory

| Accessory | Standard equipment | | Option | | |
|----------------|----------------------|-------------|----------------------|-------------------------------------|------------------|
| | Mounting nut | Rod end nut | Single knuckle joint | Double knuckle joint ⁽²⁾ | Rod boot |
| Mounting | | | | | |
| Basic style | ● (1 pc.) | ● (2 pcs.) | ● | ● | ● |
| Foot style | ● (2) | ● (2) | ● | ● | ● |
| Flange style | ● (1) | ● (2) | ● | ● | ● |
| Trunnion style | ● (1) ⁽¹⁾ | ● (2) | ● | ● | ● |
| Note | | | | | One/Both side(s) |

Note 1) Trunnion nuts are attached for trunnion style.
Note 2) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.16 | 0.25 | 0.32 | 0.65 |
| | Axial foot style | 0.31 | 0.41 | 0.48 | 0.92 |
| | Flange style | 0.22 | 0.34 | 0.41 | 0.77 |
| | Trunnion style | 0.20 | 0.32 | 0.38 | 0.75 |
| Additional weight per each 50 mm of stroke | | 0.06 | 0.09 | 0.13 | 0.19 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2WL32-100

- Basic weight.....0.48 (Foot style, ø32)
- Additional weight.....0.13/50 st
- Cylinder stroke.....100 st

$$0.48 + 0.13 \times 100/50 = 0.74 \text{ kg}$$

Minimum Stroke for Auto Switch Mounting

| Auto switch model | No. of auto switches mounted | | | | |
|--------------------------------------|------------------------------|-----------|--|---------------------|----|
| | 2 | | n | | 1 |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | $50 + 45 (n - 2)$ | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | $60 + 45 (n - 2)$ | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | $65 + 50 (n - 2)$ | 10 |
| D-B5/B6 D-G5NTL | 15 | 75 | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | $75 + 55 (n - 2)$ | 10 |
| D-B59W | 20 | 75 | $20 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | | 15 |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | $35 + 30 (n - 2)$ | $100 + 100 (n - 2)$ | 10 |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. Do not operate with the cushion needle in a fully closed condition.

Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".

3. Do not open the cushion needle wide excessively.

If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.

⚠ Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a snap ring.

When replacing rod seals and removing and mounting a snap ring, use a proper tool (snap ring plier: tool for installing a type C snap ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier. Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

5. Combine the rod end section, so that a rod boot might not be twisted.

If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2W

Air-hydro

CM2WH **Mounting style** **Bore size** **Stroke** **Rod boot**

↓ **Air-hydro**

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.

Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.



Specifications

| | |
|-------------------------------|---|
| Type | Air-hydro type |
| Fluid | Turbine oil |
| Action | Double acting, Double rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Proof pressure | 1.5 MPa |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.18 MPa |
| Piston speed | 15 to 300 mm/s |
| Ambient and fluid temperature | 5 to 60°C |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | +1.4 0 mm |
| Cushion | Rubber bumper (Standard equipment) |
| Mounting | Basic style, Axial foot style, Flange style, Trunnion style |

* Auto switch can be mounted.

- For construction, refer to page 6-4-30.
- Since the dimensions of mounting style is the same as pages 6-4-32 to 6-4-34, refer to those pages.

Built-in One-touch Fittings

CM2W **Mounting style** **Bore size** **F** **Stroke**

↓ **Built-in One-touch fittings**

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.



- For construction, refer to page 6-4-30.
- For dimensions of each mounting style, refer to pages 6-4-32 to 6-4-34.
- For other specifications, refer to page 6-4-22.

With Air Cushion

CM2W **Mounting style** **Bore size** **Stroke** **A** **Rod boot**

↓ **With air cushion**

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.



Specifications

| | |
|-------------------------|---|
| Action | Double acting, Double rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.08 MPa |
| Cushion | Air cushion |
| Piston speed | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Flange style, Trunnion style |

* Auto switch can be mounted.

Allowable Kinetic Energy

| Bore size (mm) | Effective cushion length (mm) | Kinetic energy absorbable (J) |
|----------------|-------------------------------|-------------------------------|
| 20 | 11.0 | 0.54 |
| 25 | 11.0 | 0.78 |
| 32 | 11.0 | 1.27 |
| 40 | 11.8 | 2.35 |

- For construction, refer to page 6-4-30.
- Since the dimensions of mounting style is the same as pages 6-4-32 to 6-4-34, refer to those pages.
- For other specifications, refer to page 6-4-22.

Specifications

| | |
|-------------------------|---|
| Action | Double acting, Double rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.08 MPa |
| Cushion | Rubber bumper |
| Piping | One-touch fitting |
| Piston speed | 50 to 750 mm/s |
| Mounting | Basic style, Axial foot style, Flange style, Trunnion style |

* Auto switch can be mounted.

Applicable Tubing O.D./I.D.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|--|-----|-----|-----|
| Applicable tubing O.D. (mm) | 6/4 | 6/4 | 6/4 | 8/6 |
| Applicable tubing material | Can be used for either nylon, soft nylon or polyurethane tube. | | | |

⚠ Caution

One-touch fitting cannot be replaced.

• One-touch fitting is press-fit into the cover, thus cannot be replaced.

Air Cylinder: Standard Type Double Acting, Double Rod **Series CM2W**

Clean Series

10-CM2W Mounting style Bore size Stroke

Clean Series (With relief port)

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.



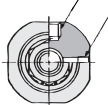
Specifications

| | | |
|-------------------------|---|--|
| Action | Double acting, Double rod | |
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.08 MPa | |
| Cushion | Rubber bumper | |
| Relief port size | M5 x 0.8 | |
| Piston speed | 30 to 400 mm/s | |
| Mounting | Basic style, Axial foot style, Flange style | |

* Auto switch can be mounted.

Construction

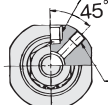
Standard port Relief port



ø20, ø25



Standard port



ø32, ø40

Relief port



Relief port

For details, refer to the separate catalog, "Pneumatic Clean Series".

Copper-free

20-CM2W Mounting style Bore size Stroke

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

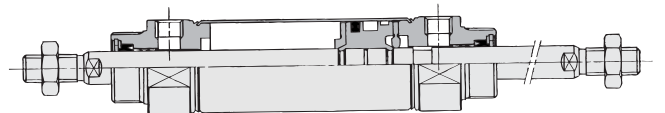


Specifications

| | | |
|-------------------------|---|-----------------|
| Action | Double acting, Double rod | |
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.08 MPa | |
| Cushion | Rubber bumper | Air cushion |
| Piston speed | 50 to 750 mm/s | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Flange style, Trunnion style | |

* Auto switch can be mounted.

Construction



The above shows the case of rubber bumper.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

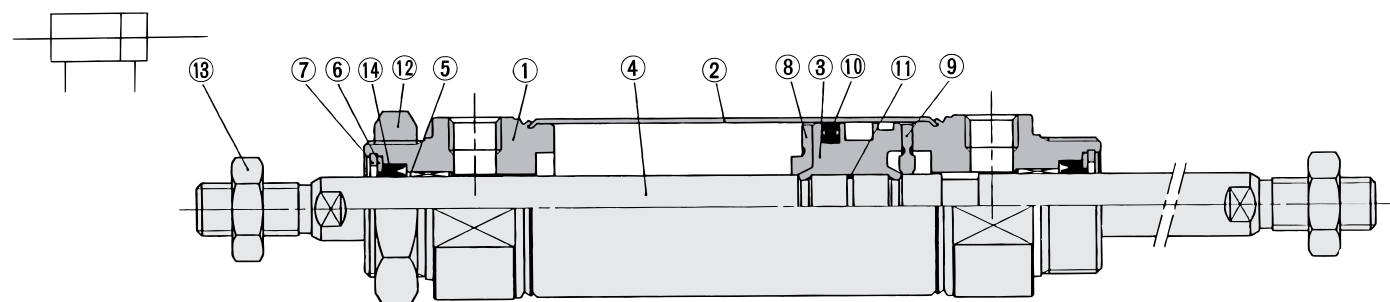
20-

Data

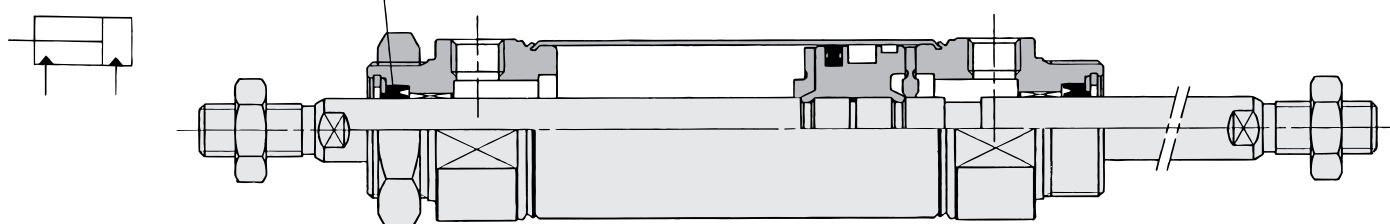
Series CM2W

Construction

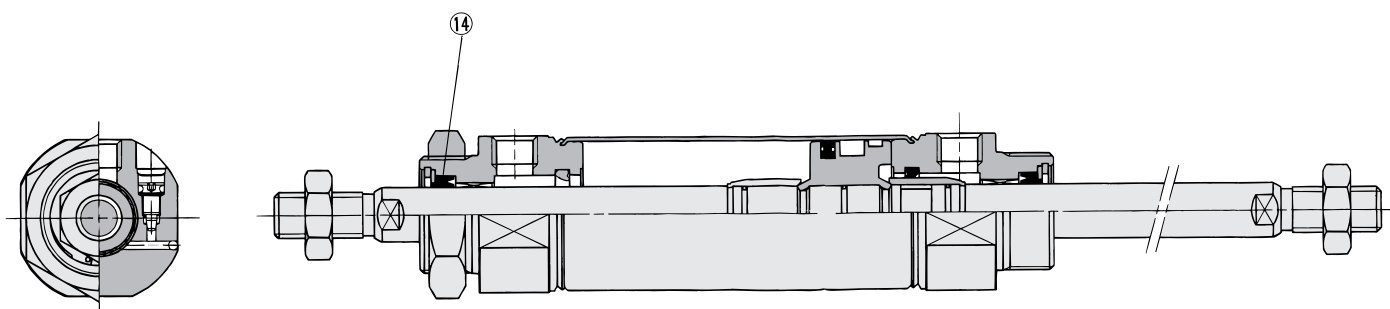
Rubber bumper



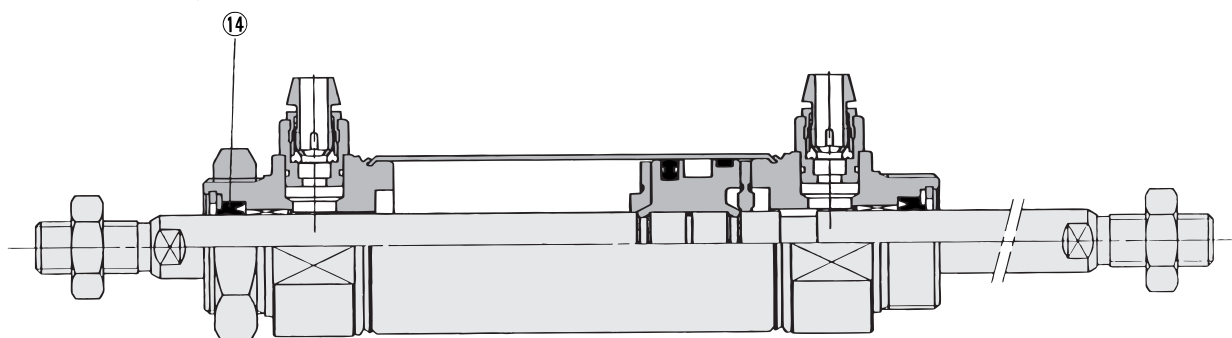
Air-hydro



With air cushion



Built-in One-touch fittings



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Cylinder tube | Stainless steel | |
| ③ | Piston | Aluminum alloy | Chromated |
| ④ | Piston rod | Carbon steel | Hard chrome plated |
| ⑤ | Bushing | Oil-impregnated sintered alloy | |
| ⑥ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑦ | Snap ring | Carbon steel | Nickel plated |
| ⑧ | Bumper A | Urethane | |
| ⑨ | Bumper B | Urethane | |
| ⑩ | Piston seal | NBR | |
| ⑪ | Piston gasket | NBR | |
| ⑫ | Mounting nut | Carbon steel | Nickel plated |
| ⑬ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts: With Rubber Bumper, With Air Cushion, Built-in One-touch Fittings

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ⑭ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |

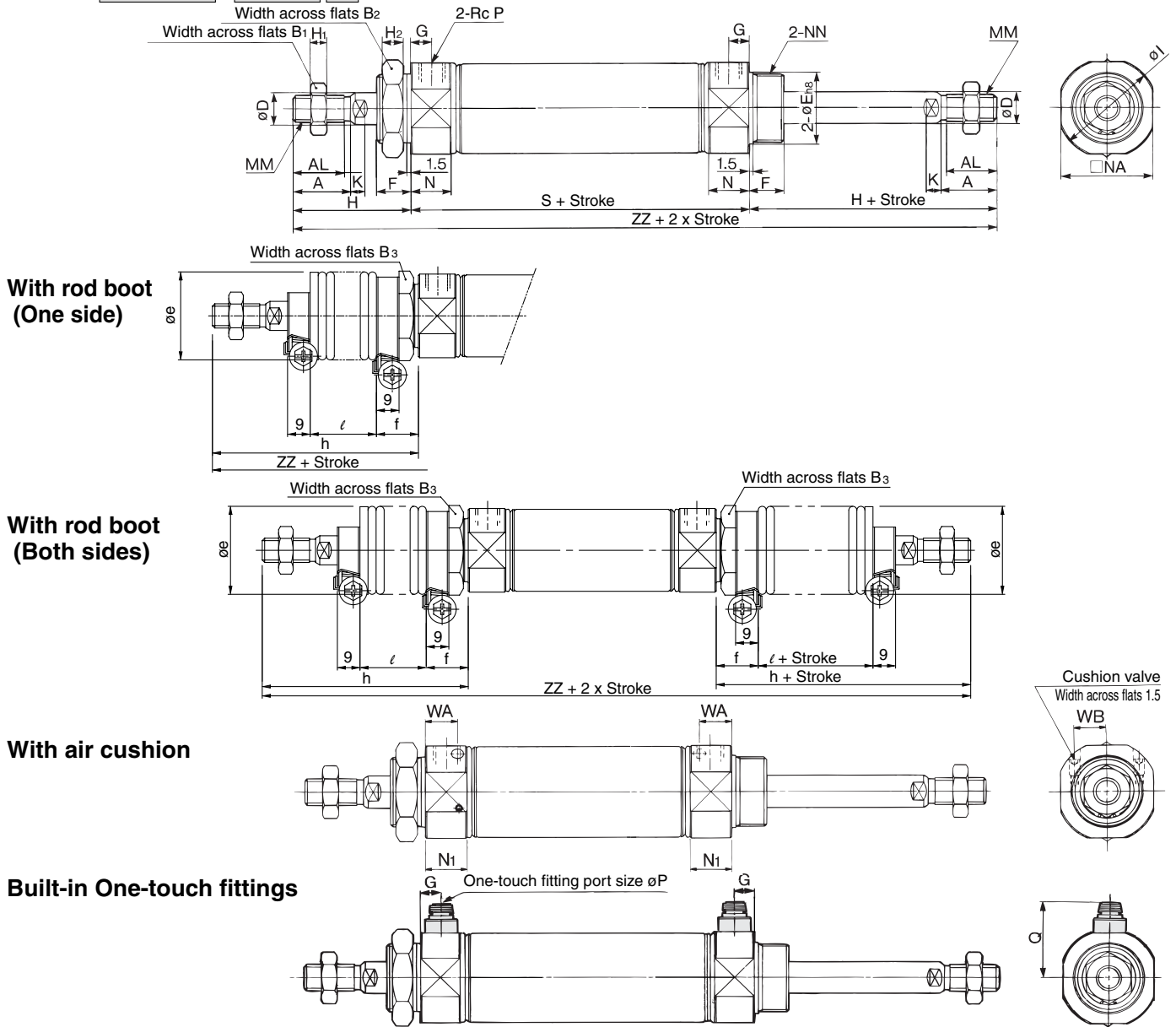
Air-hydro

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|--------|---------|--------|
| | | | 20 | 25 | 32 | 40 |
| ⑭ | Rod seal | NBR | HDU-8 | HDU-10 | HDU-12L | HDU-14 |

Air Cylinder: Standard Type Double Acting, Double Rod **Series CM2W**

Basic Style (B)

CM2WB Bore size Stroke



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | S | ZZ |
|----------------|----|------|----------------|----------------|----|----------------------|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ^{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 144 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ^{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 152 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ^{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 154 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ^{-0.039} | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 188 |

With Rod Boot

| Bore size (mm) | B ₃ | e | f | h | | | | | ℓ | | | | | ZZ (Both sides) | | | | |
|----------------|----------------|----|----|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|-----------------|-----------|------------|------------|------------|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 12.5 | 25 | 37.5 | 50 | 75 | 198 | 224 | 248 | 274 | 324 |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 12.5 | 25 | 37.5 | 50 | 75 | 206 | 232 | 256 | 282 | 332 |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 12.5 | 25 | 37.5 | 50 | 75 | 208 | 234 | 258 | 284 | 334 |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 12.5 | 25 | 37.5 | 50 | 75 | 242 | 268 | 292 | 318 | 368 |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

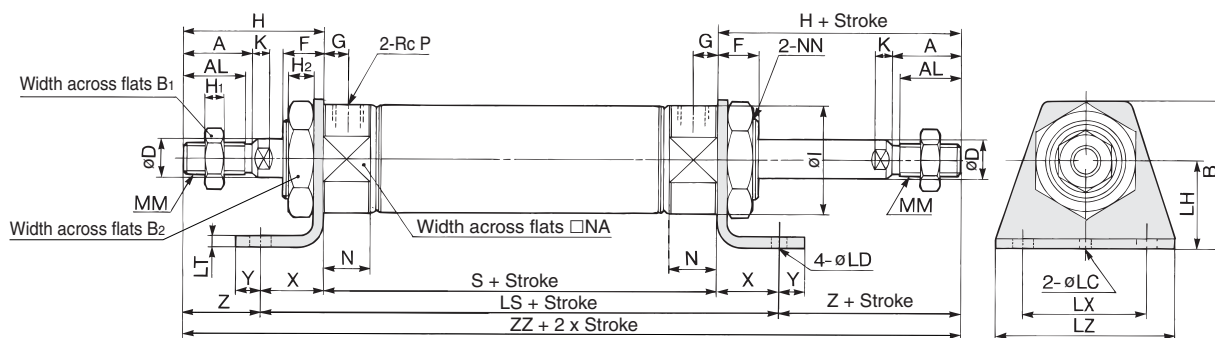
| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

| Bore size (mm) | ZZ (One side) | | | | |
|----------------|---------------|-----------|------------|------------|------------|
| | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 |
| 20 | 171 | 184 | 196 | 209 | 234 |
| 25 | 179 | 192 | 204 | 217 | 242 |
| 32 | 181 | 194 | 206 | 219 | 244 |
| 40 | 215 | 228 | 240 | 253 | 278 |

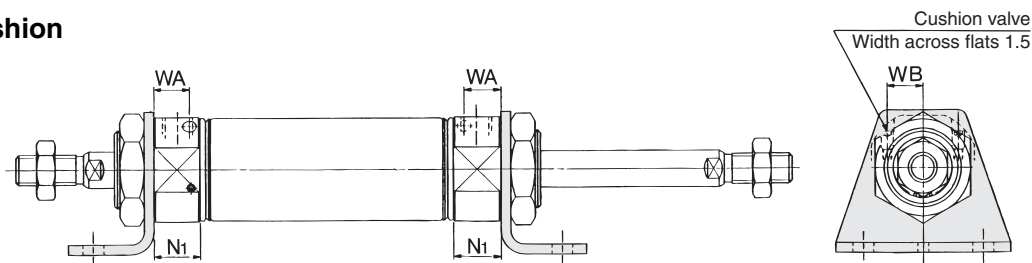
Series CM2W

Axial Foot Style (L)

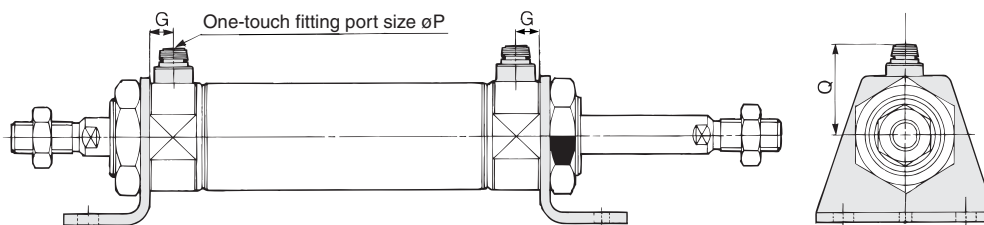
CM2WL Bore size — Stroke



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | D | F | G | H | H ₁ | H ₂ | I | K | LC | LD | LH | LS | LT | LX | LZ | MM | N | NA | NN | P | S | X | Y | Z | ZZ |
|----------------|----|------|----|----------------|----------------|----|----|----|----|----------------|----------------|------|-----|----|-----|----|-----|-----|----|----|------------|------|------|-----------|-----|----|----|----|----|-----|
| 20 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 8 | 41 | 5 | 8 | 28 | 5 | 4 | 6.8 | 25 | 102 | 3.2 | 40 | 55 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 20 | 8 | 21 | 144 |
| 25 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 4 | 6.8 | 28 | 102 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 20 | 8 | 25 | 152 |
| 32 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 4 | 6.8 | 28 | 104 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 20 | 8 | 25 | 154 |
| 40 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | 4 | 7 | 30 | 134 | 3.2 | 55 | 75 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 23 | 10 | 27 | 188 |

With Air Cushion

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

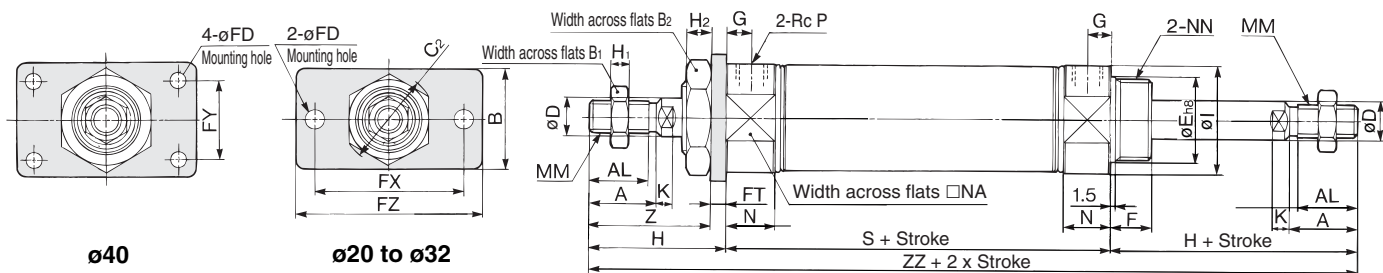


* In the case of with rod boot, refer to basic style on page 6-4-31 and f dimension on page 6-4-13.

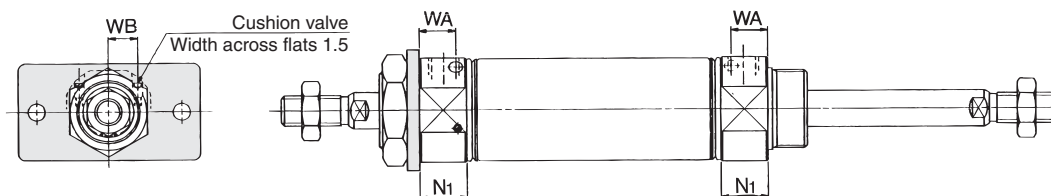
Air Cylinder: Standard Type Double Acting, Double Rod **Series CM2W**

Flange Style (F)

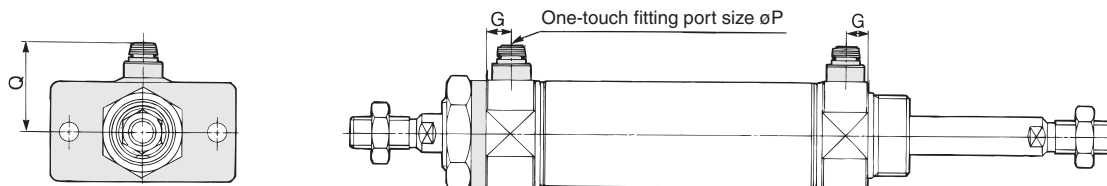
CM2WF Bore size Stroke



With air cushion



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | MM |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----|----------------|----------------|------|-----|------------|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 |

With Air Cushion

| Bore size (mm) | N | NA | NN | P | S | Z | ZZ |
|----------------|------|------|-----------|-----|----|----|-----|
| 20 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 37 | 144 |
| 25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 41 | 152 |
| 32 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 41 | 154 |
| 40 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 45 | 188 |

| Bore size (mm) | N ₁ | WA | WB |
|----------------|----------------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Built-in One-touch Fittings

| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |



* In the case of with rod boot, refer to basic style on page 6-4-31 and f dimension on page 6-4-13.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

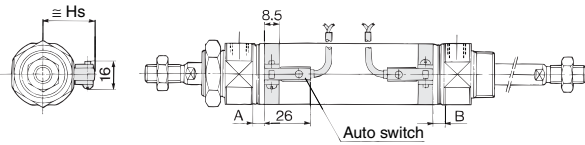
Data

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

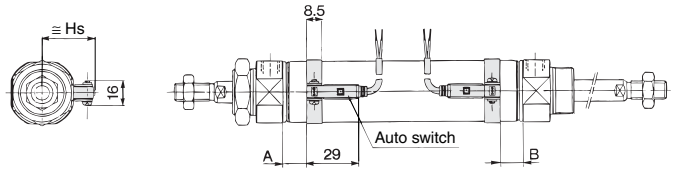
Reed switch

Solid state switch

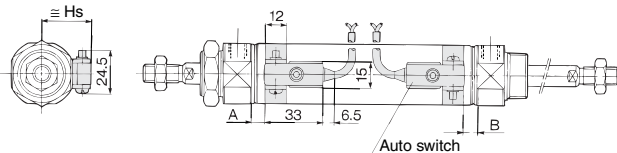
D-C7/C8



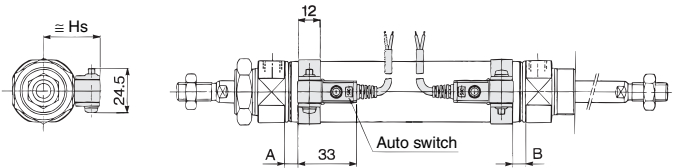
D-H7□/H7□W/H7NF/H7BAL



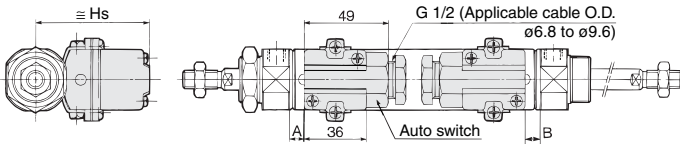
D-B5/B6/B59W



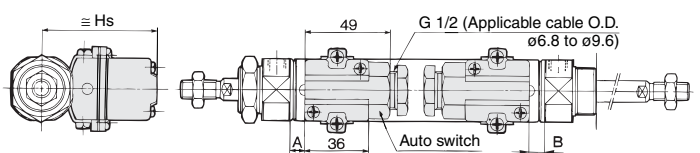
D-G5NTL



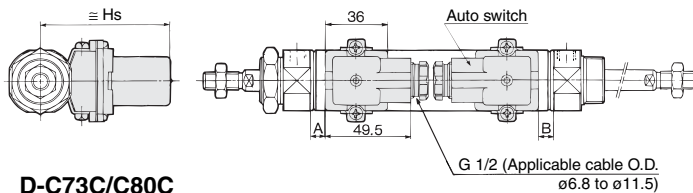
D-A33A/A34A



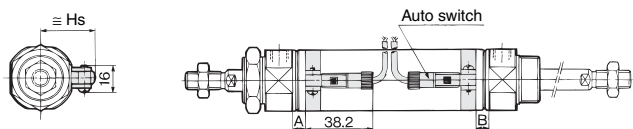
D-G39A/K39A



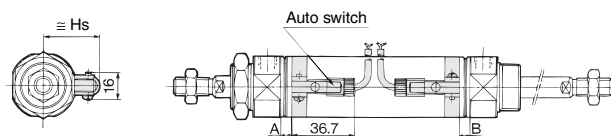
D-A44A



D-H7C



D-C73C/C80C



Proper Auto Switch Mounting Position

| Auto switch model | D-B5 D-B6 | | D-C7□ D-C80 D-C73C D-C80C | | D-B59W | | D-A3□A D-G39A D-K39A D-A44A | | D-H7 D-H7C D-H7□W D-H7BAL D-H7NF | | D-G5NTL | |
|-------------------|--------------|------|------------------------------------|------|--------|------|--------------------------------------|--------|--|------|----------|----------|
| | A | B | A | B | A | B | A | B | A | B | A | B |
| 20 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 25 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 32 | 2(0) | 1(0) | 8(6) | 7(5) | 5(3) | 4(2) | 1.5(0) | 0.5(0) | 7(5) | 6(4) | 3.5(1.5) | 2.5(0.5) |
| 40 | 7 | 6 | 13 | 12 | 10 | 9 | 6.5 | 5.5 | 12 | 11 | 8.5 | 7.5 |

* () : Denotes the values with air cushion.

D-B5/B6/A3□A/A44A/G39A/K39A cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

For the operating range of auto switch, refer to page 6-4-24.

Auto Switch Mounting Height

| D-B5 D-B6 D-B59W D-G5NTL D-H7C | D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A3□A D-G39A D-K39A | D-A44A |
|--|--|------------------|----------------------------|--------|
| Hs | Hs | Hs | Hs | Hs |
| 25.5 | 22.5 | 25 | 60 | 69.5 |
| 28 | 25 | 27.5 | 62.5 | 72 |
| 31.5 | 28.5 | 31 | 66 | 75.5 |
| 35.5 | 32.5 | 35 | 70 | 79.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XC4: With Heavy Duty Scraper

12 With Heavy Duty Scraper

Symbol

-XC4

It is suitable for using cylinders under the environment, where there are much dusts in a surrounding area by using a heavy duty scraper on the wiper ring, or using cylinders under earth and sand exposed to the die-cast equipment, construction machinery, or industrial vehicles.

Applicable Series

| Series | Description | Model | Action | Note | Vol. no. (for std model) |
|--------|---|--------|---------------------------|---|--------------------------|
| CM2 | Air cylinder | CM2 | Double acting, Single rod | | 6 |
| | | CM2W | Double acting, Double rod | | |
| | Centralized piping type | CM2□□P | Double acting, Single rod | | |
| | Cylinder with end lock | CBM2 | Double acting, Single rod | Head side locking type only (Except w/ air cushion) | |
| CG1 | Air cylinder | CG1 | Double acting, Single rod | | 6 |
| MB | Air cylinder | MB | Double acting, Single rod | | 6 |
| | | MBW | Double acting, Double rod | | |
| MB1 | Air cylinder | MB1 | Double acting, Single rod | | 6 |
| | | MB1W | Double acting, Double rod | | |
| CA2 | Air cylinder | CA2 | Double acting, Single rod | | 6 |
| | | CA2W | Double acting, Double rod | | |
| | Cylinder with end lock | CBA2 | Double acting, Single rod | Head side locking type only | |
| CS1 | Air cylinder | CS1 | Double acting, Single rod | | 6 |
| | | CS1W | Double acting, Double rod | | |
| C76 | Air cylinder | C76 | Double acting, Single rod | Refer to page 6-11-48. | 6 |
| | | C76W | Double acting, Double rod | Refer to page 6-11-48. | |
| C85 | ISO cylinder | C85 | Double acting, Single rod | Refer to page 6-11-49. | 6 |
| | | C85W | Double acting, Double rod | Refer to page 6-11-49. | |
| C95 | ISO cylinder | C95S | Double acting, Single rod | | 6 |
| CQ2 | Air cylinder | CQ2 | Double acting, Single rod | ø20 to ø100 | 7 |
| | Axial piping type (Centralized piping type) | CQP2 | Double acting, Single rod | ø32 to ø100 | |
| | Long stroke | CQ2 | Double acting, Single rod | | |
| CV | Valve mounted cylinder | CV3 | Double acting, Single rod | | 10 |
| | | CVS1 | Double acting, Single rod | | |
| MGP | Compact guide cylinder | MGP | Double acting | ø20 to ø100 | 8 |
| | | MGPA | High precision type | ø20 to ø100 | |
| MGG | Guide cylinder | MGG | Standard type | Except ø20, ø25 | 8 |
| MGC | | MGC | Compact type | Except ø20, ø25 | 8 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

How to Order

Standard model no. **-XC4**

* For Series MGP and C95,
refer to page 6-17-44.

With heavy duty scraper
(SCB scraper)

Specifications: Same as standard type.

⚠ Caution

Do not replace heavy duty scrapers.

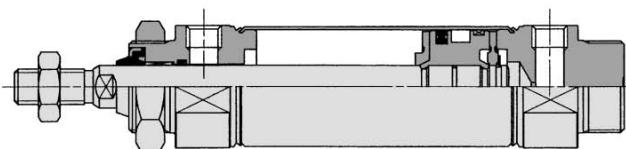
- Since a heavy duty scraper is press-fit, replace it by rod cover assembly, not a cover. (Holder plate assembly in the case of Series MGP)
Series CM2 cannot replace either heavy duty scraper or rod seal.
(It goes for replacing retainer assembly for Series CS1.)

Made to Order Common Specifications: -XC4: With Heavy Duty Scraper

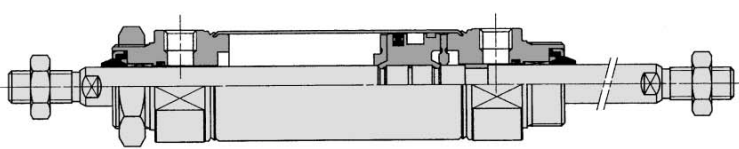
12 With Heavy Duty Scraper

Construction (Dimensions are the same as standard.)

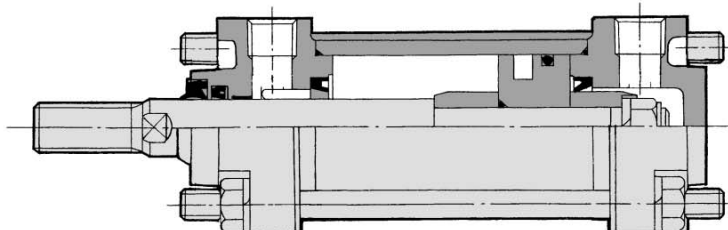
Series CM2



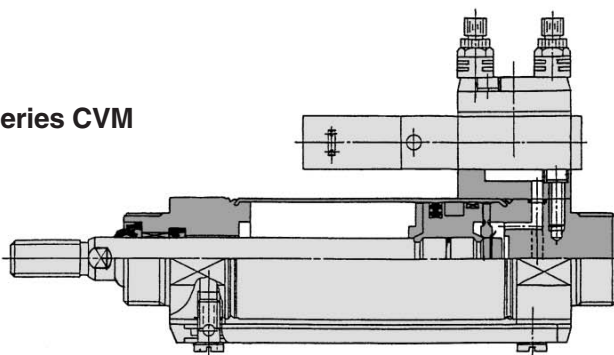
Series CM2W



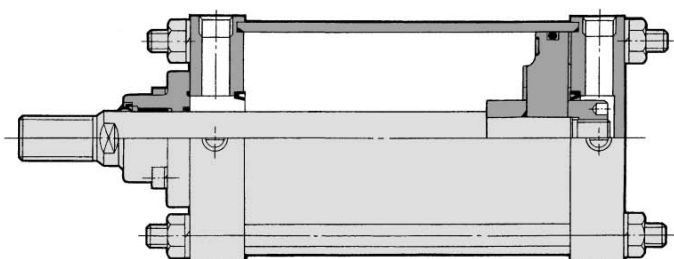
Series CA2



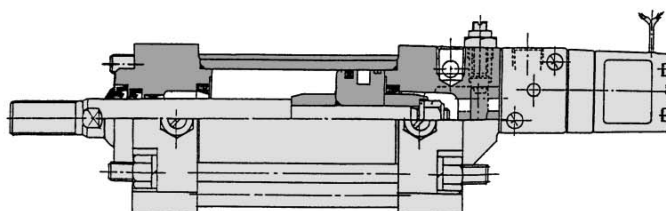
Series CVM



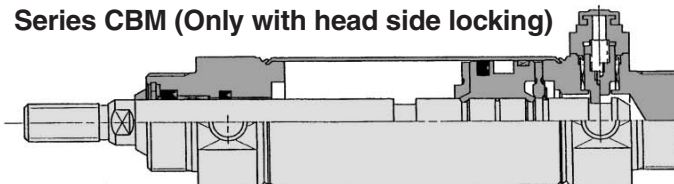
Series CS1



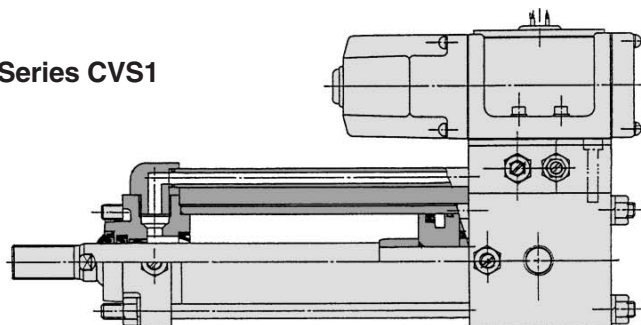
Series CV3



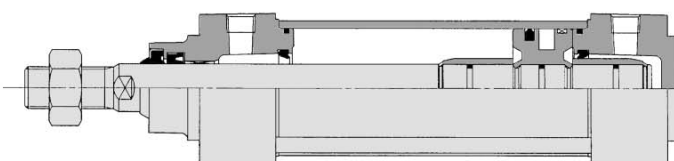
Series CBM (Only with head side locking)



Series CVS1



Series MB



Air Cylinder: Standard Type

Single Acting, Single Rod, Spring Return/Extend

Series CM2

ø20, ø25, ø32, ø40

How to Order

Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Piping

| | |
|------------|-----------------------------|
| Nil | Screw-in type |
| F | Built-in One-touch fittings |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-37.)

Without auto switch CM2 L 32 F 150 S

With auto switch CDM2 L 32 F 150 S H7BW

Bore size

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Action

| | |
|----------|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Built-in magnet

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

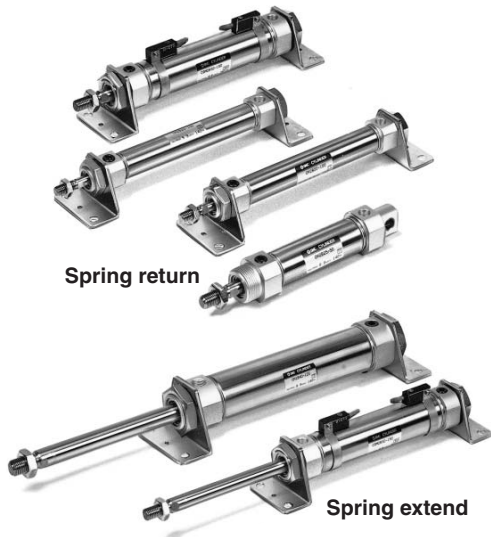
| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--|--|------------------|-----------------|---|--------------|--------------|-------------------|------------------------|--------------|-----------|----------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | | |
| | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | | | |
| | | | | | | — | C73C | ● | ● | ● | ● | — | | | | |
| | | | | | | — | A33A | — | — | — | ● | — | | | | |
| | 100 V, 200 V | | | | | A34A | — | — | — | ● | — | | | | | |
| | DIN terminal | A44A | | — | — | — | ● | — | Relay, PLC | | | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | | — | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | | |
| | | 2-wire | | 12 V | | | | H7B | ● | ● | ○ | — | ○ | | | |
| | | | | 5 V, 12 V | | | | H7C | ● | ● | ● | ● | — | | | |
| | | 3-wire (NPN) | | 5 V, 12 V | | | | G39A | — | — | — | ● | — | IC circuit | | |
| | 2-wire | 12 V | | K39A | | | | — | — | — | ● | — | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | | | 5 V, 12 V | H7NW | ● | ● | ○ | — | ○ | | IC circuit |
| | | | | 3-wire (PNP) | | | | | H7PW | ● | ● | ○ | — | ○ | | |
| | | | | 2-wire | | | | | H7BW | ● | ● | ○ | — | ○ | | |
| | | | | | | | | | 12 V | H7BA | — | ● | ○ | — | | ○ |
| | | | | With diagnostic output (2-color indication) | | | | | 3-wire (NPN) | 5 V, 12 V | H7NF | ● | ● | ○ | | — |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend Series CM2



Specifications

| Action | Single acting, Spring return | Single acting, Spring extend |
|-------------------------------|---|------------------------------|
| Type | Pneumatic | |
| Cushion | Rubber bumper | |
| Fluid | Air | |
| Proof pressure | 1.5 MPa | |
| Maximum operating pressure | 1.0 MPa | |
| Minimum operating pressure | 0.18 MPa | 0.23 MPa |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $^{+1.4}_0$ mm | |
| Piston speed | 50 to 750 mm/s | |

Allowable Kinetic Energy

| Bore size (mm) | 20 | 25 | 32 | 40 |
|------------------------------|------|-----|------|-----|
| Allowable kinetic energy (J) | 0.27 | 0.4 | 0.65 | 1.2 |

Standard Stroke

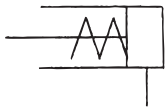
| Bore size (mm) | Standard stroke (mm) ⁽¹⁾ |
|----------------|-------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150 |
| 25 | 25, 50, 75, 100, 125, 150 |
| 32 | 25, 50, 75, 100, 125, 150, 200 |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250 |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

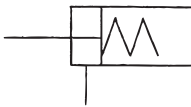
Note 2) Please contact SMC for longer strokes.

JIS Symbol

Single acting,
Spring return



Spring extend



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XC3 | Special port location |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC20 | Head cover axial port |
| -XC25 | No fixed orifice of connecting port |
| -XC27 | Double clevis pin and double knuckle pin made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC52 | Mounting nut with set screw |

Minimum Stroke for Auto Switch Mounting

(mm)

| Auto switch model | No. of auto switches mounted | | | | |
|--------------------------------------|------------------------------|-----------|--|--|-----------------|
| | 2 | | n | | 1 |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 50 + 45 (n – 2) | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | 60 + 45 (n – 2) | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 65 + 50 (n – 2) |
| D-B5/B6 D-G5NTL | 15 | 75 | $15 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 75 + 55 (n – 2) | 10 |
| D-B59W | 20 | 75 | $20 + 50 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | | 15 |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | 35 + 30 (n – 2) | 100 + 100 (n – 2) | 10 |

Mounting Bracket

For the mounting bracket part numbers other than basic style, refer to page 6-4-38.

Auto Switch Mounting Bracket

For the mounting bracket part number for auto switch (Band part no.), refer to page 6-4-38.

Theoretical Output

Refer to "Theoretical Output 1" on page 6-19-7.

Spring Reaction Force

Refer to page 6-19-3 for "Spring Reaction Force".

Series CM2

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type) (mm)

| ø20 | ø25 | ø32 | ø40 |
|------|------|------|------|
| ▲ 13 | ▲ 13 | ▲ 13 | ▲ 16 |

Mounting style

- Boss-cut basic style (BZ)
- Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

Mounting Style and Accessory

| Accessory | Standard equipment | | | Option | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis bracket ⁽⁴⁾ |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — |
| Axial foot style | ● (2) | ● | — | ● | ● | — |
| Rod side flange style | ● (1) | ● | — | ● | ● | — |
| Head side flange style | ● (1) | ● | — | ● | ● | — |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — |
| Rod side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — |



Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Accessory Bracket

For mounting brackets, refer to pages 6-4-21 to 6-4-22.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|----------------------------|----------|----------|----------|----------|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | CM-L040B |
| Flange | CM-F020B | CM-F032B | CM-F040B | CM-F040B |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | CM-C040B |
| Double clevis** (With pin) | CM-D020B | CM-D032B | CM-D040B | CM-D040B |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | CM-T040B |

* Two foot brackets and a mounting nut are attached.
Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size 40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5

BBA4: For D-C7/C8/H7

• “D-H7BAL” switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, “BBA4” screws are attached.

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CM2**

Weight

Spring Return

| Bore size (mm) | | (kg) | | | |
|-------------------------|---------------------------------|-------|-------|-------|-------|
| | | 20 | 25 | 32 | 40 |
| Basic weight | 25 stroke | 0.20 | 0.30 | 0.42 | 0.77 |
| | 50 stroke | 0.22 | 0.33 | 0.46 | 0.84 |
| | 75 stroke | 0.27 | 0.42 | 0.58 | 1.03 |
| | 100 stroke | 0.29 | 0.45 | 0.63 | 1.09 |
| | 125 stroke | 0.35 | 0.54 | 0.76 | 1.29 |
| | 150 stroke | 0.37 | 0.57 | 0.80 | 1.36 |
| | 200 stroke | — | — | 0.97 | 1.61 |
| | 250 stroke | — | — | — | 1.87 |
| Mounting bracket weight | Foot style | 0.15 | 0.16 | 0.16 | 0.27 |
| | Flange style | 0.06 | 0.09 | 0.09 | 0.12 |
| | Single clevis style | 0.04 | 0.04 | 0.04 | 0.09 |
| | Double clevis style | 0.05 | 0.06 | 0.06 | 0.13 |
| | Trunnion style | 0.04 | 0.07 | 0.07 | 0.10 |
| | Clevis integrated style | -0.02 | -0.02 | -0.01 | -0.04 |
| | Boss-cut basic style | -0.01 | -0.02 | -0.02 | -0.03 |
| | Boss-cut flange style | 0.05 | 0.07 | 0.07 | 0.09 |
| | Boss-cut trunnion style | 0.03 | 0.05 | 0.05 | 0.07 |
| | Pivot bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2L32-100S (Bore size ø32, Foot style, 100 stroke)
0.63 (Basic weight) + 0.16 (Mounting bracket weight) = 0.79 kg

Spring Extend

| Bore size (mm) | | (kg) | | | |
|-------------------------|---------------------------------|-------|-------|-------|-------|
| | | 20 | 25 | 32 | 40 |
| Basic weight | 25 stroke | 0.19 | 0.29 | 0.40 | 0.74 |
| | 50 stroke | 0.21 | 0.32 | 0.44 | 0.81 |
| | 75 stroke | 0.25 | 0.39 | 0.54 | 0.97 |
| | 100 stroke | 0.27 | 0.42 | 0.58 | 1.03 |
| | 125 stroke | 0.32 | 0.49 | 0.69 | 1.20 |
| | 150 stroke | 0.34 | 0.52 | 0.73 | 1.27 |
| | 200 stroke | — | — | 0.88 | 1.49 |
| | 250 stroke | — | — | — | 1.72 |
| Mounting bracket weight | Foot style | 0.15 | 0.16 | 0.16 | 0.27 |
| | Flange style | 0.06 | 0.09 | 0.09 | 0.12 |
| | Single clevis style | 0.04 | 0.04 | 0.04 | 0.09 |
| | Double clevis style | 0.05 | 0.06 | 0.06 | 0.13 |
| | Trunnion style | 0.04 | 0.07 | 0.07 | 0.10 |
| | Clevis integrated style | -0.02 | -0.02 | -0.01 | -0.04 |
| | Boss-cut basic style | -0.01 | -0.02 | -0.02 | -0.03 |
| | Boss-cut flange style | 0.05 | 0.07 | 0.07 | 0.09 |
| | Boss-cut trunnion style | 0.03 | 0.05 | 0.05 | 0.07 |
| | Pivot bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Built-in One-touch Fitting

CM2 **Mounting style** **Bore size** **F** — **Stroke** **Action**

● Built-in One-touch fitting

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.



- For construction, refer to page 6-4-41.
- For dimensions of each mounting style, refer to pages 6-4-43 to 6-4-50.
- For other specifications, refer to page 6-4-37.

Specifications

| Action | Single acting, Spring return | Single acting, Spring extend |
|-------------------------|--|------------------------------|
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.18 MPa | 0.23 MPa |
| Cushion | Rubber bumper | |
| Piping | Built-in One-touch fitting | |
| Piston speed | 50 to 750 mm/s | |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style | |

* Auto switch can be mounted.

Applicable Tubing O.D./I.D.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|--|-----|-----|-----|
| Applicable tubing O.D. (mm) | 6/4 | 6/4 | 6/4 | 8/6 |
| Applicable tubing material | Can be used for either nylon, soft nylon or polyurethane tubing. | | | |

⚠ Caution

- One-touch fitting cannot be replaced.
- One-touch fitting is press-fit into the cover, thus cannot be replaced.

Series CM2

Copper-free

20-CM2 **Mounting style** **Bore size** **Stroke** **Action**

└ Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

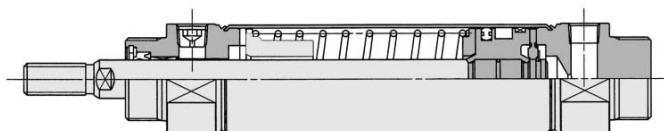


Specifications

| Action | Single acting, Spring return | Single acting, Spring extend |
|-------------------------|--|------------------------------|
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.18 MPa | 0.23 MPa |
| Cushion | Rubber bumper | |
| Piston speed | 50 to 750 mm/s | |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style | |

* Auto switch can be mounted.

Construction



* The above shows the case of single acting, spring return type.

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

⚠ Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a snap ring.

When replacing rod seals and removing and mounting a snap ring, use a proper tool (snap ring plier: tool for installing a type C snap ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier. Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. One-touch fitting cannot be replaced.

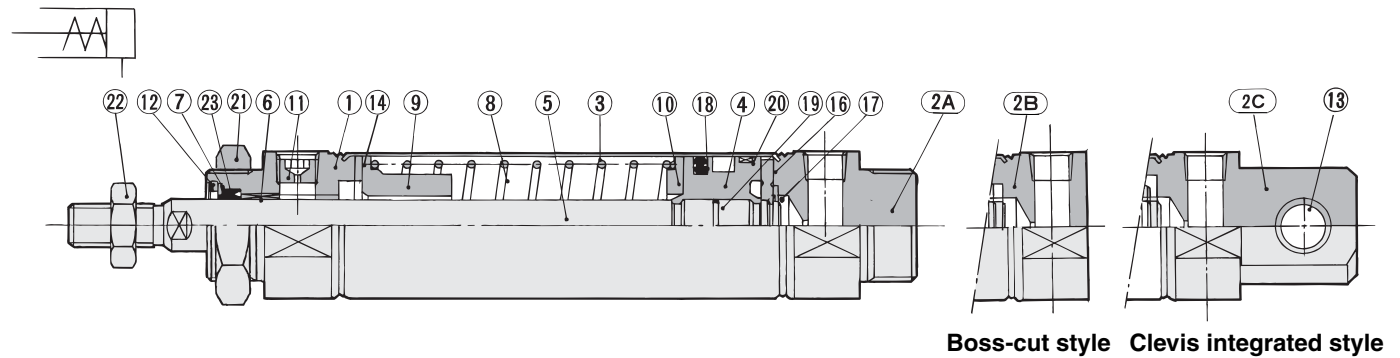
One-touch fitting is press-fit into the cover, thus cannot be replaced.

Air Cylinder: Standard Type

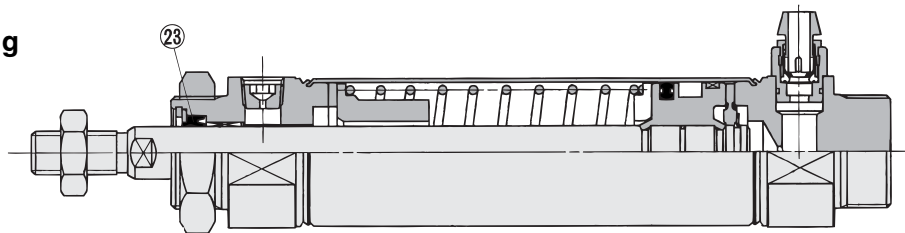
Single Acting, Single Rod, Spring Return/Extend Series CM2

Construction

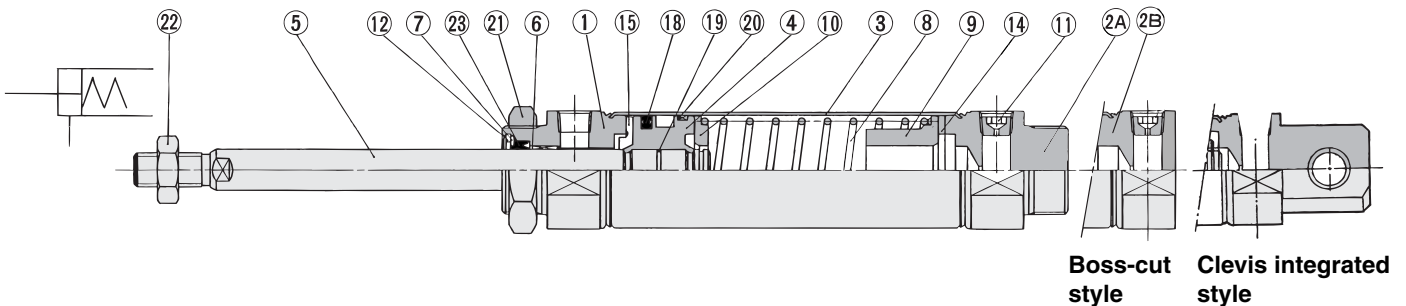
Spring return



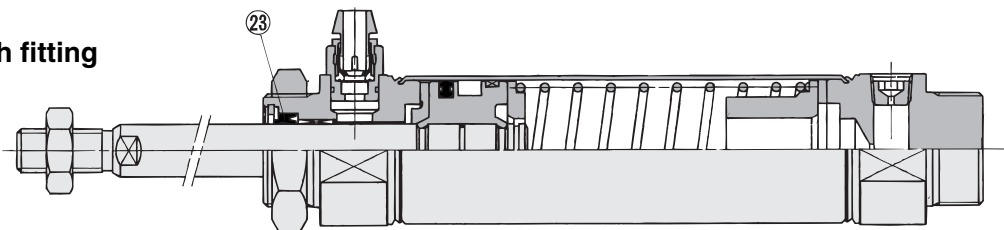
Spring return, Built-in One-touch fitting



Spring extend



Spring extend, Built-in One-touch fitting



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|--------------------------------|-----------------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ②A | Head cover A | Aluminum alloy | Clear anodized * |
| ②B | Head cover B | Aluminum alloy | Clear anodized ** |
| ②C | Head cover B | Aluminum alloy | Clear anodized *** |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Carbon steel | Hard chromium electroplated |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Return spring | Steel wire | Zinc chromated |
| ⑨ | Spring guide | Aluminum alloy | Chromated |
| ⑩ | Spring seat | Aluminum alloy | Chromated |
| ⑪ | Plug with fixed orifice | Alloy steel | Black zinc chromated |
| ⑫ | Snap ring | Carbon steel | Nickel plated |

* Basic style, ** Boss-cut style, *** Clevis integrated style

| No. | Description | Material | Note |
|-----|----------------|--------------------------------|---------------|
| ⑬ | Clevis bushing | Oil-impregnated sintered alloy | |
| ⑭ | Bumper | Urethane | |
| ⑮ | Bumper A | Urethane | |
| ⑯ | Bumper B | Urethane | |
| ⑰ | Snap ring | Stainless steel | |
| ⑱ | Piston seal | NBR | |
| ⑲ | Piston gasket | NBR | |
| ⑳ | Wear ring | Resin | |
| ㉑ | mounting nut | Carbon steel | Nickel plated |
| ㉒ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts: With Rubber Bumper, Built-in One-touch Fitting

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ㉓ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

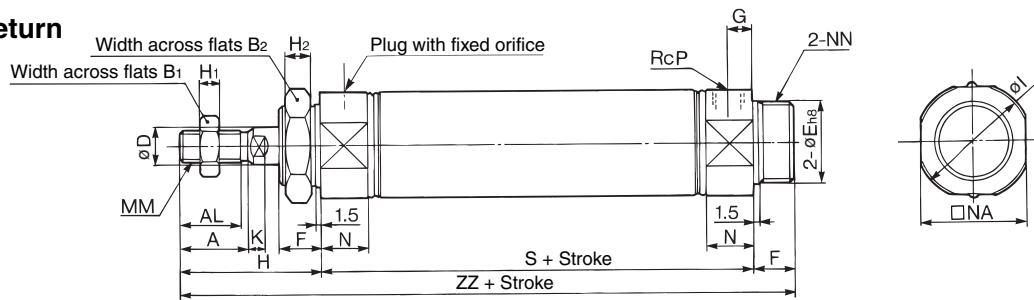
Data

Series CM2

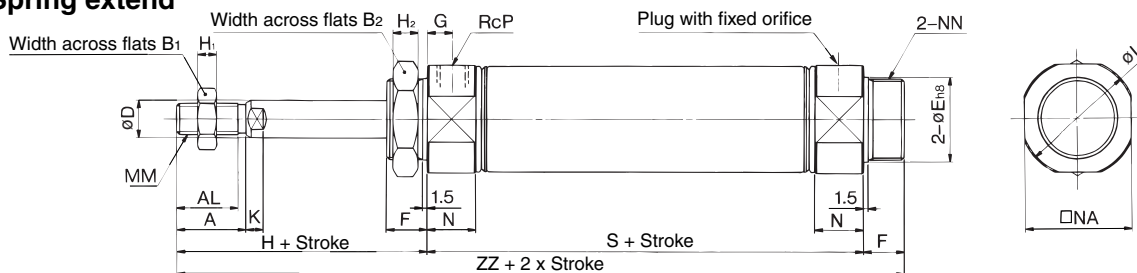
Basic Style (B)

CM2B Bore size — Stroke $\frac{S}{T}$

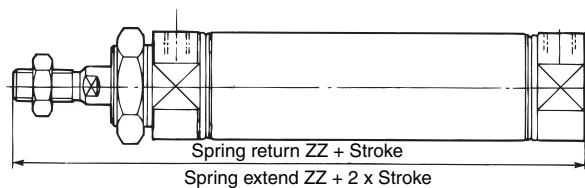
Spring return



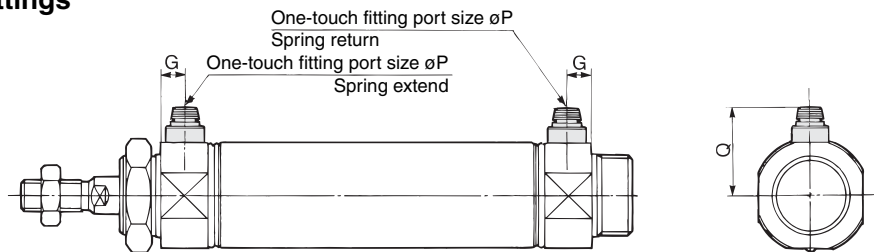
Spring extend



Boss-cut style



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 |

Dimensions by Stroke

| Bore size (mm) | Stroke | | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|----------------|--------|--|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | Symbol | | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | | | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | | | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | | | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | | | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

Boss-cut Style

| Bore size (mm) | Stroke | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
|----------------|--------|--|---------|-----------|------------|------------|------------|
| | Symbol | | ZZ | ZZ | ZZ | ZZ | ZZ |
| 20 | | | 128 | 153 | 178 | — | — |
| 25 | | | 132 | 157 | 182 | — | — |
| 32 | | | 134 | 159 | 184 | 209 | — |
| 40 | | | 163 | 188 | 213 | 238 | 263 |

Built-in One-touch Fittings

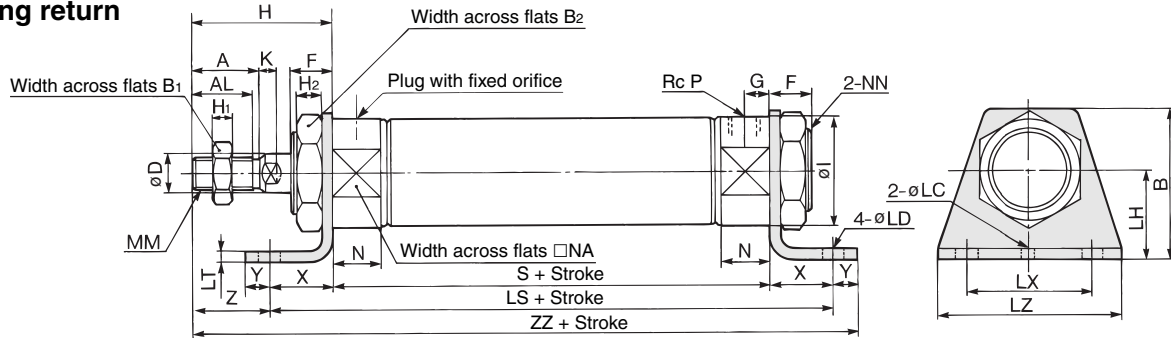
| Bore size (mm) | G | P | Q |
|----------------|----|---|------|
| 20 | 8 | 6 | 21.5 |
| 25 | 8 | 6 | 24.5 |
| 32 | 8 | 6 | 27 |
| 40 | 11 | 8 | 32.5 |

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CM2**

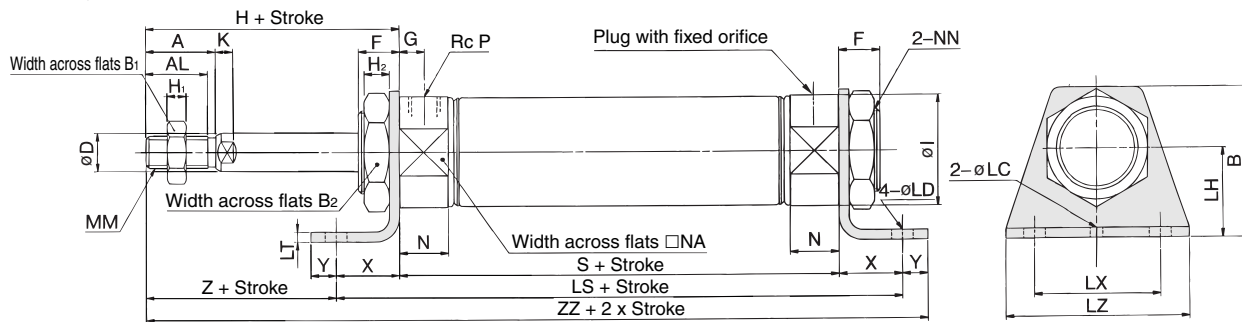
Axial Foot Style (L)

CM2L Bore size — Stroke $\frac{S}{T}$

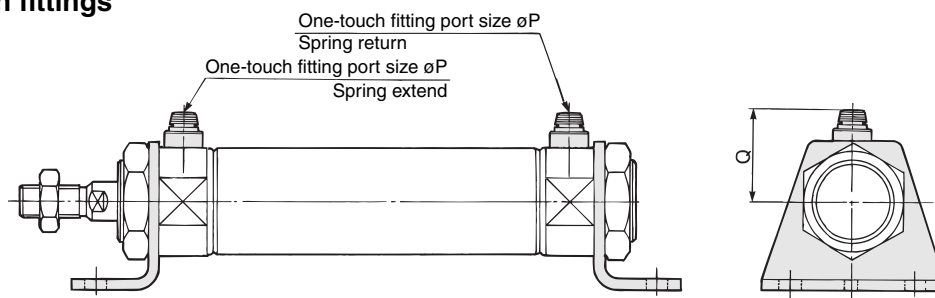
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | D | F | G | H | H ₁ | H ₂ | I | K | LC | LD | LH | LT | LX | LZ | MM | N | NA | NN | P | X | Y | Z |
|----------------|----|------|----|----------------|----------------|----|----|----|----|----------------|----------------|------|-----|----|-----|----|-----|----|----|------------|------|------|-----------|-----|----|----|----|
| 20 | 18 | 15.5 | 40 | 13 | 26 | 8 | 13 | 8 | 41 | 5 | 8 | 28 | 5 | 4 | 6.8 | 25 | 3.2 | 40 | 55 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 20 | 8 | 21 |
| 25 | 22 | 19.5 | 47 | 17 | 32 | 10 | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 4 | 6.8 | 28 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 20 | 8 | 25 |
| 32 | 22 | 19.5 | 47 | 17 | 32 | 12 | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 4 | 6.8 | 28 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 20 | 8 | 25 |
| 40 | 24 | 21 | 54 | 22 | 41 | 14 | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | 4 | 7 | 30 | 3.2 | 55 | 75 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 23 | 10 | 27 |

Dimensions by Stroke

| Stroke Symbol | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|------------------|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|-----|-----|
| | LS | S | ZZ | LS | S | ZZ | LS | S | ZZ | LS | S | ZZ | LS | S | ZZ |
| 20 | 127 | 87 | 156 | 152 | 112 | 181 | 177 | 137 | 206 | — | — | — | — | — | — |
| 25 | 127 | 87 | 160 | 152 | 112 | 185 | 177 | 137 | 210 | — | — | — | — | — | — |
| 32 | 129 | 89 | 162 | 154 | 114 | 187 | 179 | 139 | 212 | 204 | 164 | 237 | — | — | — |
| 40 | 159 | 113 | 196 | 184 | 138 | 221 | 209 | 163 | 246 | 234 | 188 | 271 | 259 | 213 | 296 |

Built-in One-touch Fittings

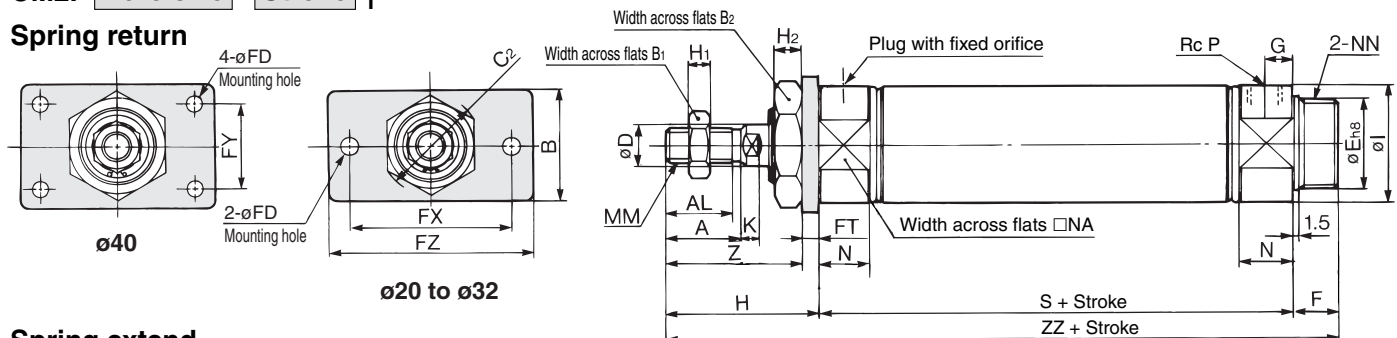
| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Series CM2

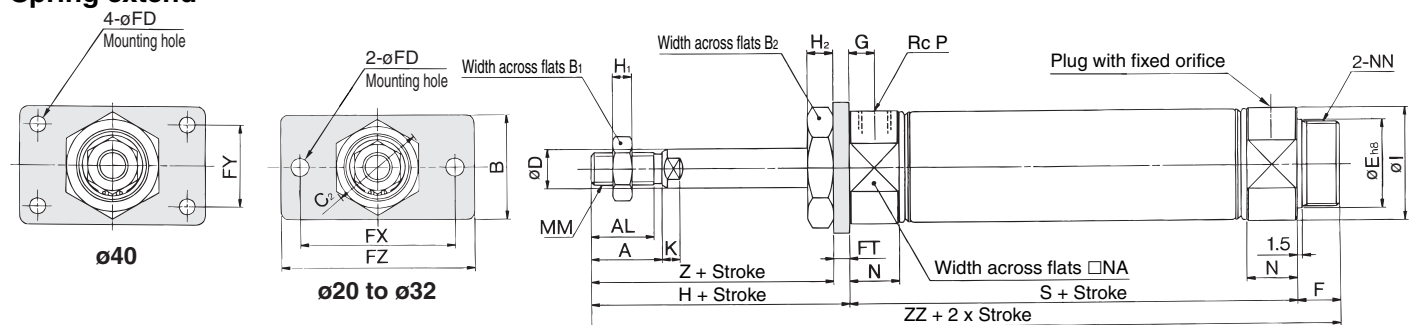
Rod Side Flange Style (F)

CM2F Bore size — Stroke $\frac{S}{T}$

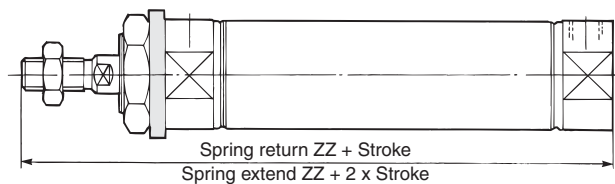
Spring return



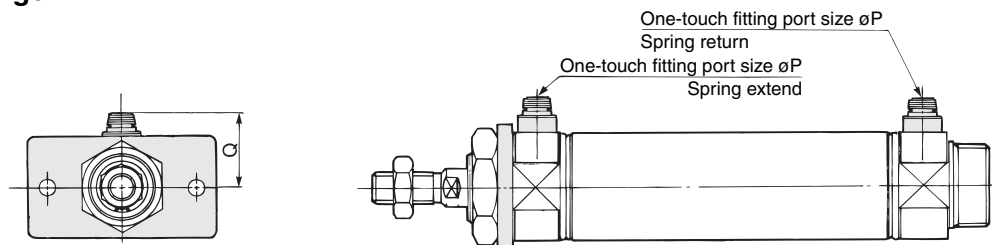
Spring extend



Boss-cut style



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | Z |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|----|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 37 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 41 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 41 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 45 |

Dimensions by Stroke

| <div>Stroke</div> <div>Symbol</div> | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|-------------------------------------|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| Bore size (mm) | | | | | | | | | | |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

Built-in One-touch Fittings

| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Boss-cut Style

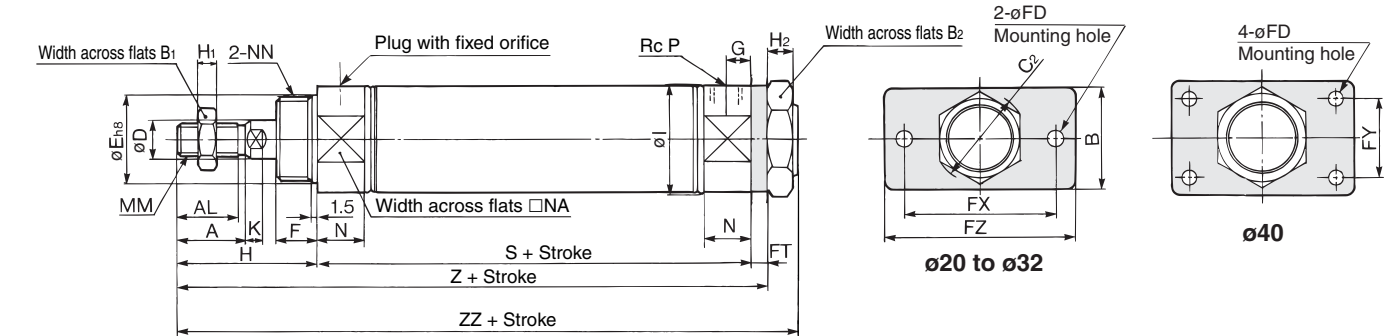
| Stroke Symbol | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
|------------------|---------|-----------|------------|------------|------------|
| | ZZ | ZZ | ZZ | ZZ | ZZ |
| Bore size (mm) | | | | | |
| 20 | 128 | 153 | 178 | — | — |
| 25 | 132 | 157 | 182 | — | — |
| 32 | 134 | 159 | 184 | 209 | — |
| 40 | 163 | 188 | 213 | 238 | 263 |

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CM2**

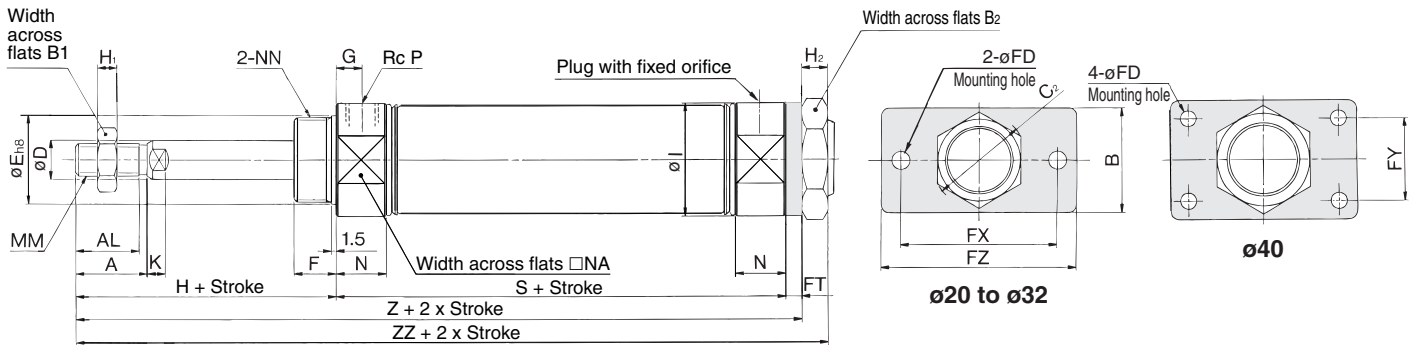
Head Side Flange Style (G)

CM2G Bore size — Stroke $\frac{S}{T}$

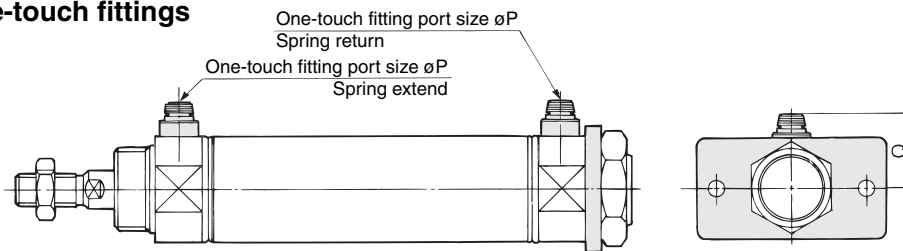
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B | B ₁ | B ₂ | C ₂ | D | E | F | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P |
|----------------|----|------|----|----------------|----------------|----------------|----|-----------------------------------|----|----|----|----|----|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|
| 20 | 18 | 15.5 | 34 | 13 | 26 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 40 | 17 | 32 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 40 | 17 | 32 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 52 | 22 | 41 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 |

Dimensions by Stroke

| Stroke | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|----------------|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|-----|-----|
| Bore size (mm) | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 132 | 141 | 112 | 157 | 166 | 137 | 182 | 191 | — | — | — | — | — | — |
| 25 | 87 | 136 | 145 | 112 | 161 | 170 | 137 | 186 | 195 | — | — | — | — | — | — |
| 32 | 89 | 138 | 147 | 114 | 163 | 172 | 139 | 188 | 197 | 164 | 213 | 222 | — | — | — |
| 40 | 113 | 168 | 179 | 138 | 193 | 204 | 163 | 218 | 229 | 188 | 243 | 254 | 213 | 268 | 279 |

Built-in One-touch Fittings

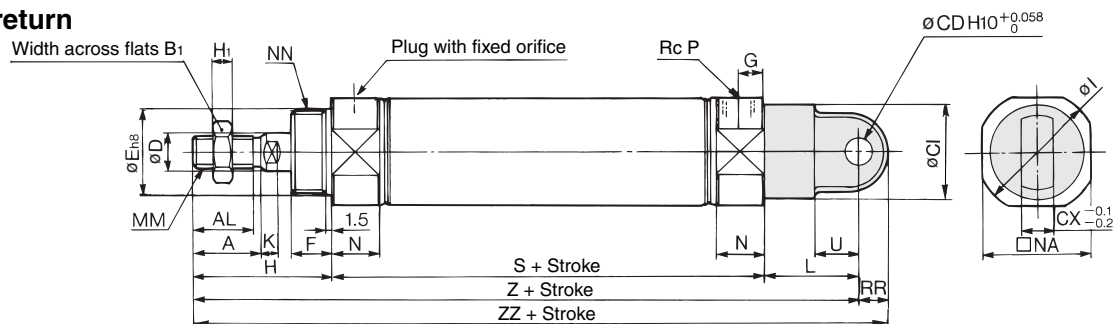
| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Series CM2

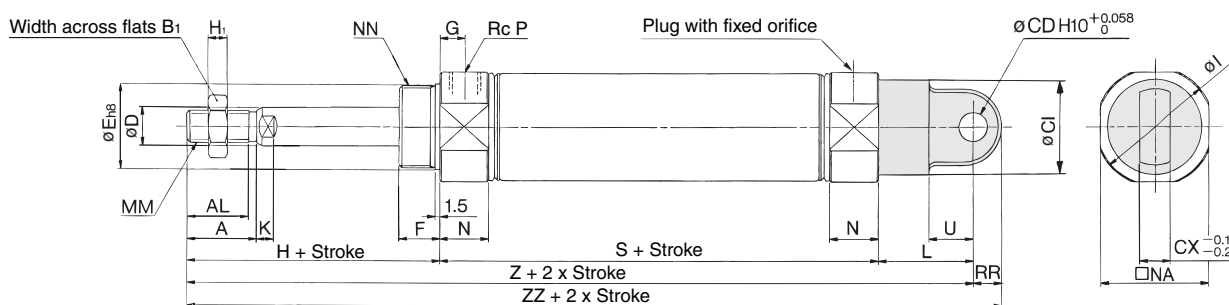
Single Clevis Style (C)

CM2C Bore size — Stroke $\frac{S}{T}$

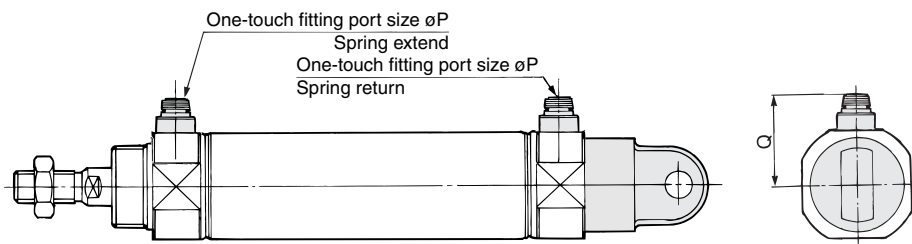
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | CD | CI | CX | D | E | F | G | H | H ₁ | I | K | L | MM | N | NA | NN | P | RR | U |
|----------------|----|------|----------------|----|----|----|----|-----------------------------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 10 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 9 | 14 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 10 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 14 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 10 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 14 |
| 40 | 24 | 21 | 22 | 10 | 38 | 15 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 11 | 18 |

Dimensions by Stroke

| Stroke Symbol | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|------------------|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|-----|-----|
| | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 158 | 167 | 112 | 183 | 192 | 137 | 208 | 217 | — | — | — | — | — | — |
| 25 | 87 | 162 | 171 | 112 | 187 | 196 | 137 | 212 | 221 | — | — | — | — | — | — |
| 32 | 89 | 164 | 173 | 114 | 189 | 198 | 139 | 214 | 223 | 164 | 239 | 248 | — | — | — |
| 40 | 113 | 202 | 213 | 138 | 227 | 238 | 163 | 252 | 263 | 188 | 277 | 288 | 213 | 302 | 313 |

Built-in One-touch Fittings

| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

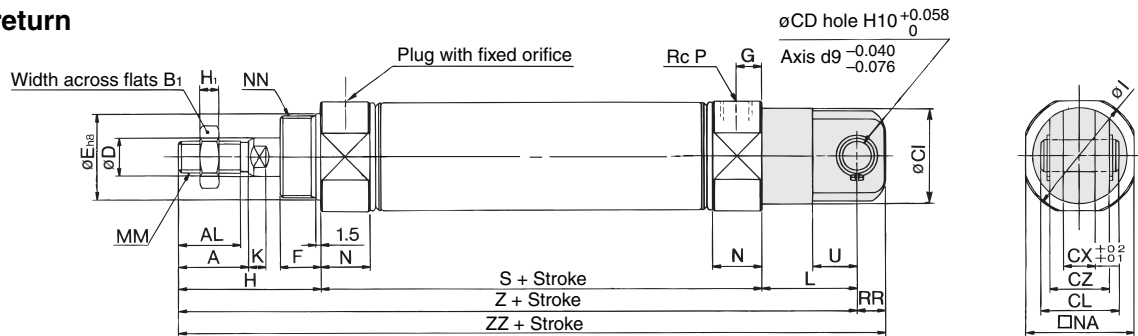
Air Cylinder: Standard Type

Single Acting, Single Rod, Spring Return/Extend Series CM2

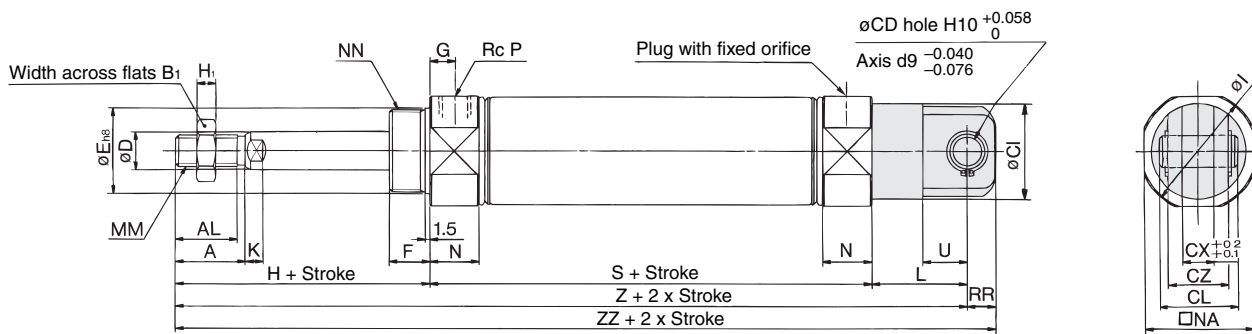
Double Clevis Style (D)

CM2D Bore size — Stroke $\frac{S}{T}$

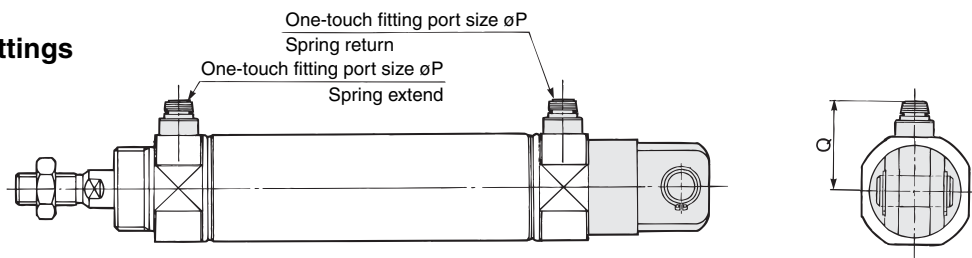
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | CD | CI | CL | CX | CZ | D | E | F | G | H | H ₁ | I | K | L | MM | N | NA | NN | P | RR | U |
|----------------|----|------|----------------|----|----|------|----|----|----|-----------------------------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|----|
| 20 | 18 | 15.5 | 13 | 9 | 24 | 25 | 10 | 19 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 9 | 14 |
| 25 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 14 |
| 32 | 22 | 19.5 | 17 | 9 | 30 | 25 | 10 | 19 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 14 |
| 40 | 24 | 21 | 22 | 10 | 38 | 41.2 | 15 | 30 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 11 | 18 |

Dimensions by Stroke

| Stroke | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|--------|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|-----|-----|
| Symbol | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 158 | 167 | 112 | 183 | 192 | 137 | 208 | 217 | — | — | — | — | — | — |
| 25 | 87 | 162 | 171 | 112 | 187 | 196 | 137 | 212 | 221 | — | — | — | — | — | — |
| 32 | 89 | 164 | 173 | 114 | 189 | 198 | 139 | 214 | 223 | 164 | 239 | 248 | — | — | — |
| 40 | 113 | 202 | 213 | 138 | 227 | 238 | 163 | 252 | 263 | 188 | 277 | 288 | 213 | 302 | 313 |

Built-in One-touch Fittings

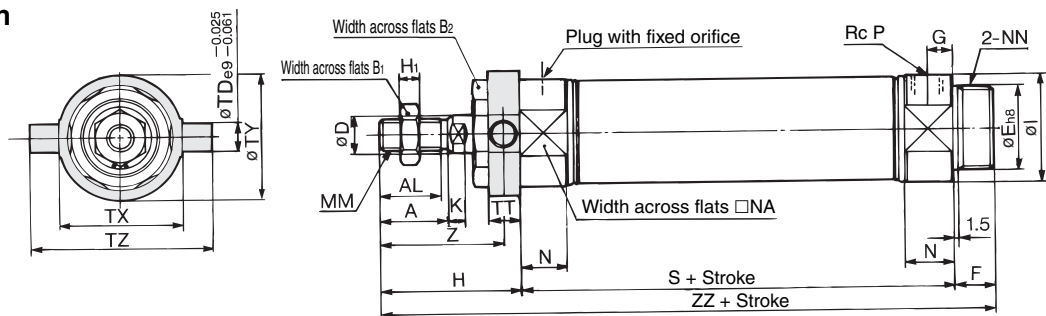
| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Series CM2

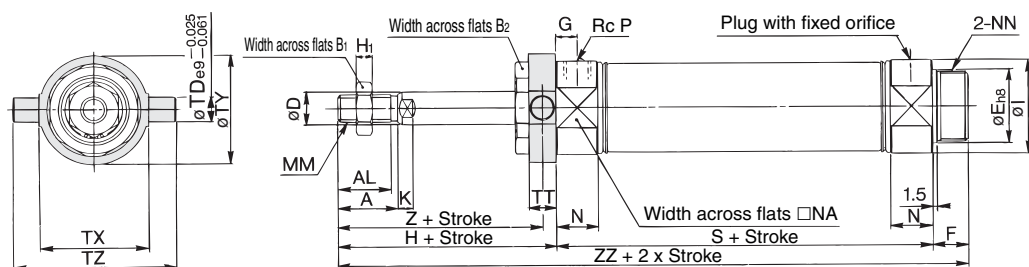
Rod Side Trunnion Style (U)

CM2U Bore size — Stroke $\frac{S}{T}$

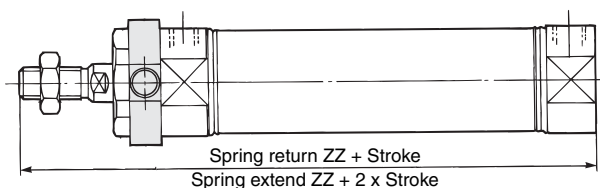
Spring return



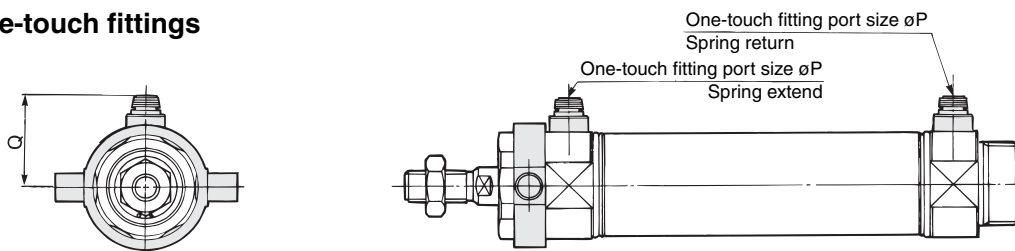
Spring extend



Boss-cut style



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | I | K | MM | N | NA | NN | P | TD | TT | TX | TY | TZ | Z |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|------|-----|------------|------|------|-----------|-----|----|----|----|----|----|------|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 8 | 10 | 32 | 32 | 52 | 36 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 10 | 40 | 40 | 60 | 40 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 10 | 40 | 40 | 60 | 40 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 10 | 11 | 53 | 53 | 77 | 44.5 |

Dimensions by Stroke

| Bore size (mm) | Stroke 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|----------------|----------------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

Boss-cut Style

| Stroke Symbol Bore size (mm) | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
|------------------------------------|-----------|-----------|------------|------------|------------|
| 20 | ZZ | ZZ | ZZ | ZZ | ZZ |
| 25 | 128 | 153 | 178 | — | — |
| 32 | 132 | 157 | 182 | — | — |
| 32 | 134 | 159 | 184 | 209 | — |
| 40 | 163 | 188 | 213 | 238 | 263 |

Built-in One-touch Fittings

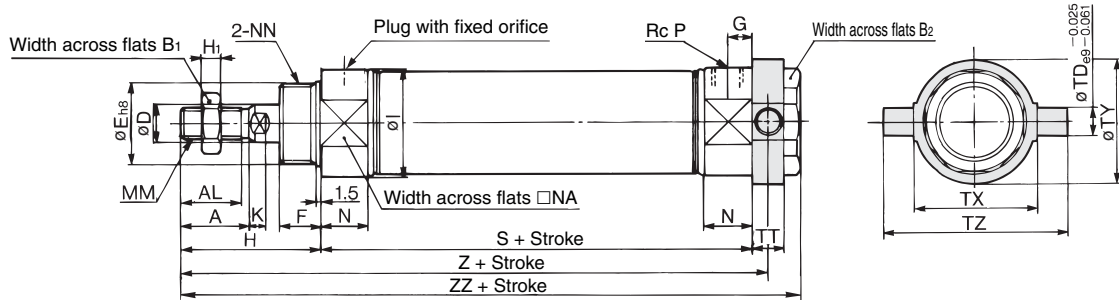
| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CM2**

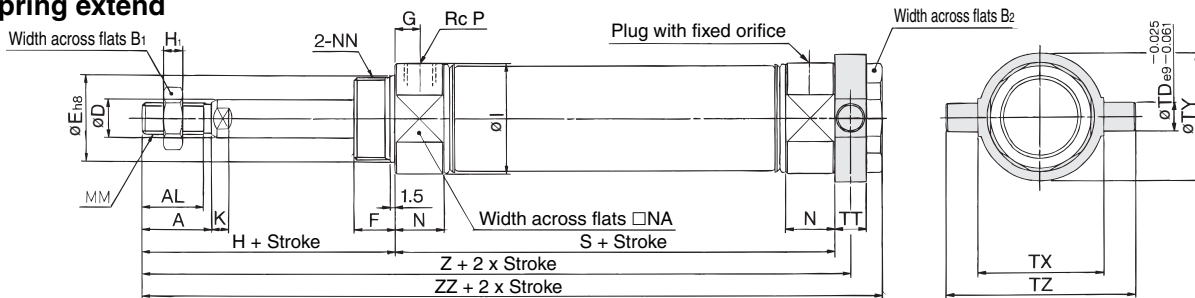
Head Side Trunnion Style (T)

CM2T Bore size Stroke $\frac{S}{T}$

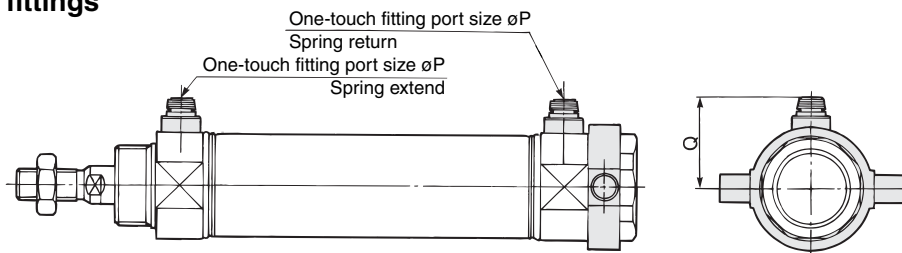
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | I | K | MM | N | NA | NN | P | TD | TT | TX | TY | TZ |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|------|-----|------------|------|------|-----------|-----|----|----|----|----|----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 8 | 10 | 32 | 32 | 52 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 9 | 10 | 40 | 40 | 60 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 9 | 10 | 40 | 40 | 60 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 10 | 11 | 53 | 53 | 77 |

Dimensions by Stroke

| Bore size (mm) | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|----------------|---------|-------|-----|-----------|-------|-----|------------|-------|-----|------------|-------|-----|------------|-------|-----|
| | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 133 | 143 | 112 | 158 | 168 | 137 | 183 | 193 | — | — | — | — | — | — |
| 25 | 87 | 137 | 147 | 112 | 162 | 172 | 137 | 187 | 197 | — | — | — | — | — | — |
| 32 | 89 | 139 | 149 | 114 | 164 | 174 | 139 | 189 | 199 | 164 | 214 | 224 | — | — | — |
| 40 | 113 | 168.5 | 179 | 138 | 193.5 | 204 | 163 | 218.5 | 229 | 188 | 243.5 | 254 | 213 | 268.5 | 279 |

Built-in One-touch Fittings

| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

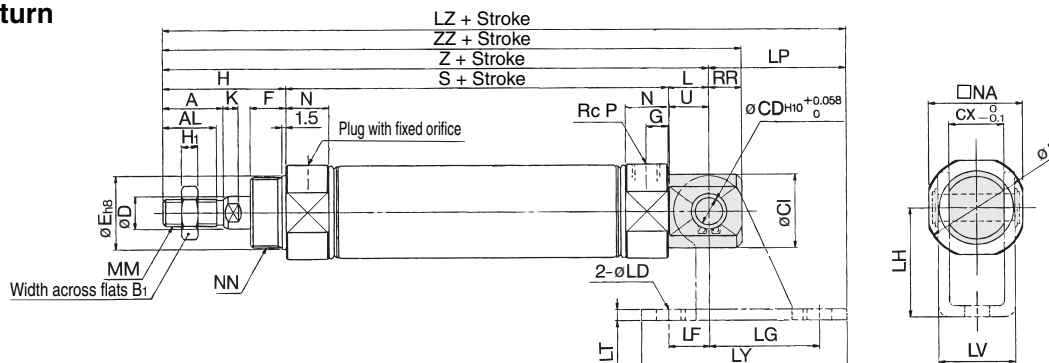
Data

Series CM2

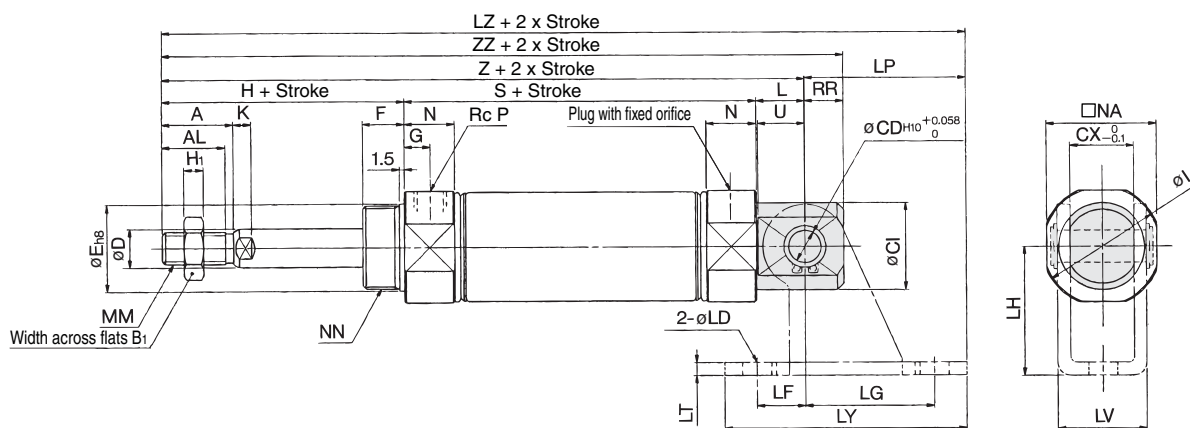
Clevis Integrated Style (E)

CM2E Bore size — Stroke $\frac{S}{T}$

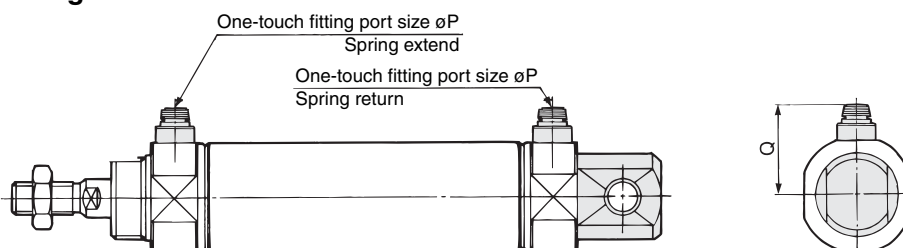
Spring return



Spring extend



Built-in One-touch fittings



| Bore size (mm) | A | AL | B ₁ | CD | CI | CX | D | E | F | G | H | H ₁ | I | K | L | MM | N | NA | NN | P | RR | U |
|----------------|----|------|----------------|----|----|----|----|-----------------------------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----------------------------|----|------|
| 20 | 18 | 15.5 | 13 | 8 | 20 | 12 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 28 | 5 | 12 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | ¹ / ₈ | 9 | 11.5 |
| 25 | 22 | 19.5 | 17 | 8 | 22 | 12 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 33.5 | 5.5 | 12 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | ¹ / ₈ | 9 | 11.5 |
| 32 | 22 | 19.5 | 17 | 10 | 27 | 20 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 37.5 | 5.5 | 15 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | ¹ / ₈ | 12 | 14.5 |
| 40 | 24 | 21 | 22 | 10 | 33 | 20 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 46.5 | 7 | 15 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | ¹ / ₄ | 12 | 14.5 |

Dimensions by Stroke

| Bore size (mm) | 1 to 50 | | | 51 to 100 | | | 101 to 150 | | | 151 to 200 | | | 201 to 250 | | |
|----------------|---------|-----|-----|-----------|-----|-----|------------|-----|-----|------------|-----|-----|------------|-----|-----|
| | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ | S | Z | ZZ |
| 20 | 87 | 140 | 149 | 112 | 165 | 174 | 137 | 190 | 199 | — | — | — | — | — | — |
| 25 | 87 | 144 | 153 | 112 | 169 | 178 | 137 | 194 | 203 | — | — | — | — | — | — |
| 32 | 89 | 149 | 161 | 114 | 174 | 186 | 139 | 199 | 211 | 164 | 224 | 236 | — | — | — |
| 40 | 113 | 178 | 190 | 138 | 203 | 215 | 163 | 228 | 240 | 188 | 253 | 265 | 213 | 278 | 290 |

Clevis Pivot Bracket

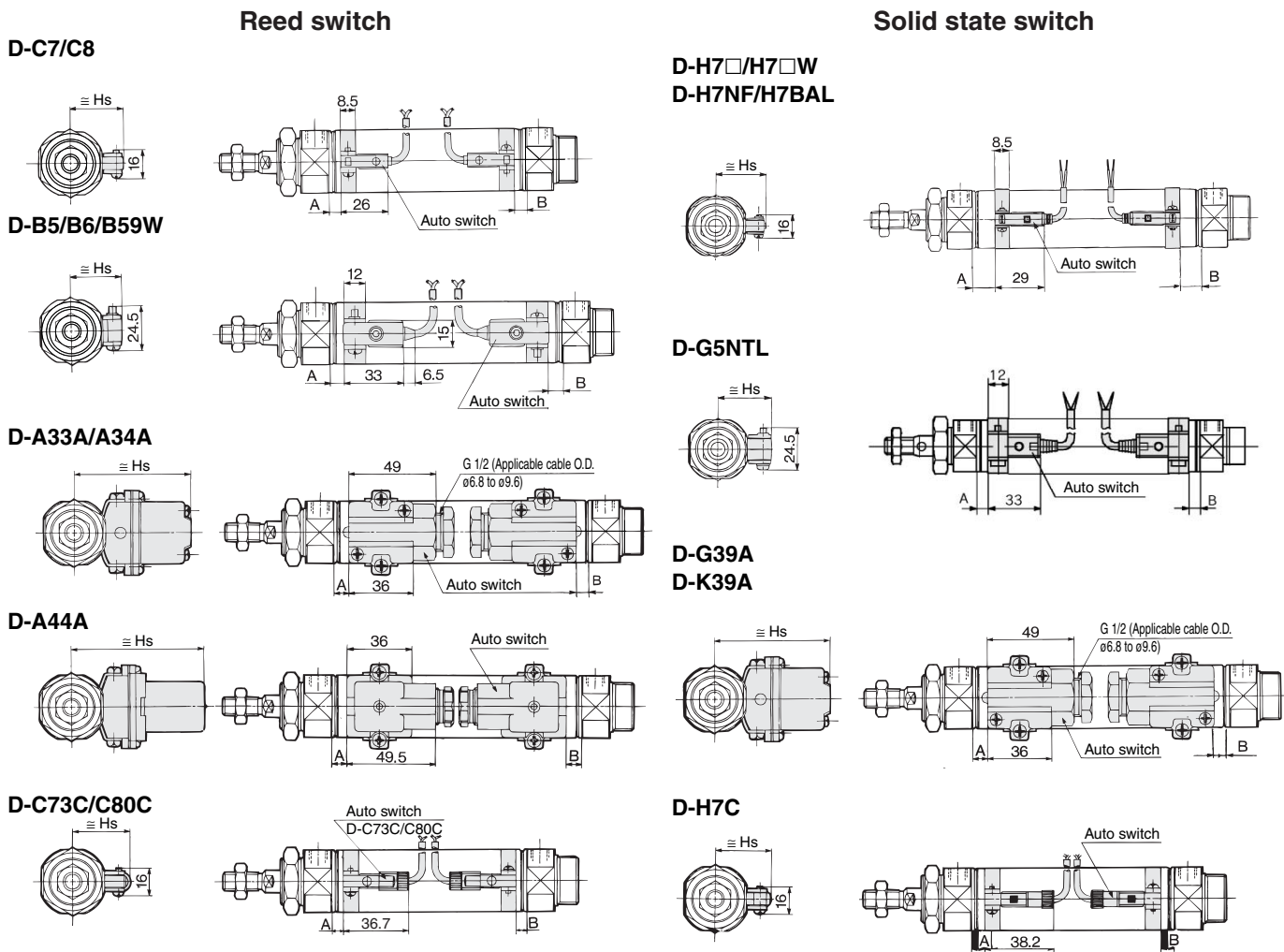
| Bore size (mm) | LD | LF | LG | LH | LP | LT | LV | LY | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
|----------------|-----|----|----|----|----|-----|------|----|---------|-----------|------------|------------|------------|
| | | | | | | | | | LZ | LZ | LZ | LZ | LZ |
| 20 | 6.8 | 15 | 30 | 30 | 37 | 3.2 | 18.4 | 59 | 177 | 202 | 227 | — | — |
| 25 | 6.8 | 15 | 30 | 30 | 37 | 3.2 | 18.4 | 59 | 181 | 206 | 231 | — | — |
| 32 | 9 | 15 | 40 | 40 | 50 | 4 | 28 | 75 | 199 | 224 | 249 | 274 | — |
| 40 | 9 | 15 | 40 | 40 | 50 | 4 | 28 | 75 | 228 | 253 | 278 | 303 | 328 |

Built-in One-touch Fittings

| Bore size (mm) | P | Q |
|----------------|---|------|
| 20 | 6 | 21.5 |
| 25 | 6 | 24.5 |
| 32 | 6 | 27 |
| 40 | 8 | 32.5 |

Air Cylinder: Standard Type Single Acting, Single Rod, Spring Return/Extend **Series CDM2**

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height/ Single Acting, Spring Return (S)



Proper Auto Switch Mounting Position/Spring Return (S)

| Auto switch model | Bore size (mm) | A dimension | | | | | B |
|--|----------------|-------------|-----------|------------|------------|------------|-----|
| | | Up to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 200 to 250 | |
| D-B5 D-B6 | 20 | 26 | 51 | 76 | — | — | 0 |
| | 25 | 26 | 51 | 76 | — | — | 0 |
| | 32 | 27 | 52 | 77 | 102 | — | 1 |
| | 40 | 32 | 57 | 82 | 107 | 132 | 6 |
| D-C7□ D-C80 D-C73C D-C80C | 20 | 32 | 57 | 82 | — | — | 6 |
| | 25 | 32 | 57 | 82 | — | — | 6 |
| | 32 | 33 | 58 | 83 | 108 | — | 7 |
| | 40 | 38 | 63 | 88 | 113 | 138 | 12 |
| D-B59W | 20 | 29 | 54 | 79 | — | — | 3 |
| | 25 | 29 | 54 | 79 | — | — | 3 |
| | 32 | 30 | 55 | 80 | 105 | — | 4 |
| | 40 | 35 | 60 | 85 | 110 | 135 | 9 |
| D-A3□A D-G39A D-K39A D-A44A | 20 | 25.5 | 50.5 | 75.5 | — | — | 0 |
| | 25 | 25.5 | 50.5 | 75.5 | — | — | 0 |
| | 32 | 26.5 | 51.5 | 76.5 | 101.5 | — | 0.5 |
| | 40 | 31.5 | 56.5 | 81.5 | 106.5 | 131.5 | 5.5 |
| D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | 20 | 31 | 56 | 81 | — | — | 5 |
| | 25 | 31 | 56 | 81 | — | — | 5 |
| | 32 | 32 | 57 | 82 | 107 | — | 6 |
| | 40 | 37 | 62 | 87 | 112 | 137 | 11 |
| D-G5NTL | 20 | 27.5 | 52.5 | 77.5 | — | — | 1.5 |
| | 25 | 27.5 | 52.5 | 77.5 | — | — | 1.5 |
| | 32 | 28.5 | 53.5 | 78.5 | 103.5 | — | 2.5 |
| | 40 | 33.5 | 58.5 | 83.5 | 108.5 | 133.5 | 7.5 |

Auto Switch Mounting Height

| Auto switch model | Bore size (mm) | Hs |
|--|----------------|------|
| D-B5/B6 D-B59W D-G5NTL | 20 | 25.5 |
| | 25 | 28 |
| | 32 | 31.5 |
| | 40 | 35.5 |
| D-C7/C8 D-H7□ D-H7□W D-H7BAL D-H7NF | 20 | 22.5 |
| | 25 | 25 |
| | 32 | 28.5 |
| | 40 | 32.5 |
| D-C73C D-C80C D-H7C | 20 | 25 |
| | 25 | 27.5 |
| | 32 | 31 |
| | 40 | 35 |
| D-A3□A D-G39A D-K39A | 20 | 60 |
| | 25 | 62.5 |
| | 32 | 66 |
| | 40 | 70 |
| D-A44A | 20 | 69.5 |
| | 25 | 72 |
| | 32 | 75.5 |
| | 40 | 79.5 |

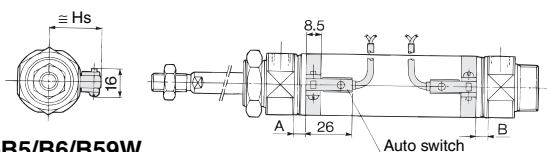
For the operating range of auto switch, refer to page 6-4-24.

Series CDM2

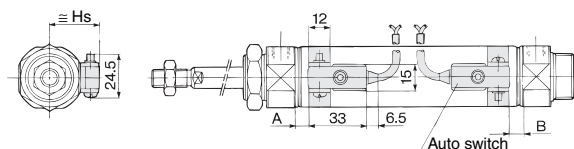
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height/ Single Acting, Spring Extend (T)

Reed switch

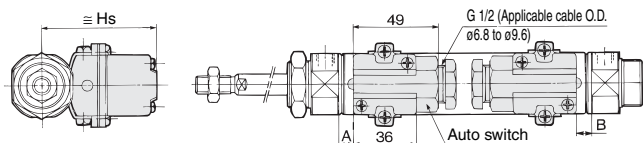
D-C7/C8



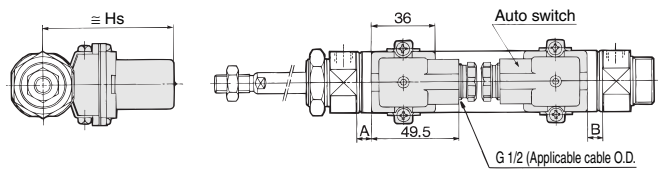
D-B5/B6/B59W



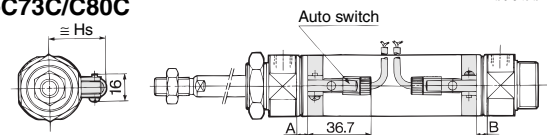
D-A33A/A34A



D-A44A

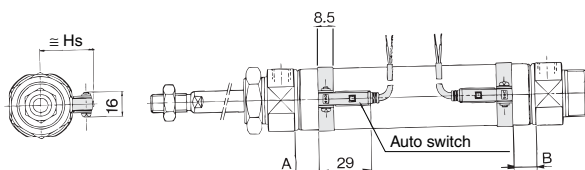


D-C73C/C80C

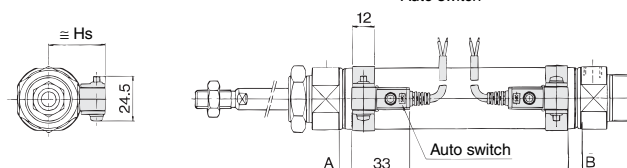


Solid state switch

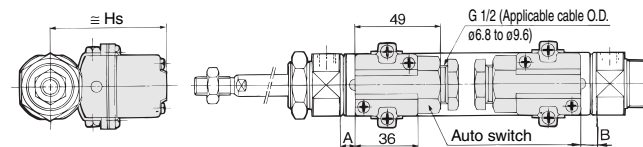
D-H7□/H7□W
D-H7NF/H7BAL



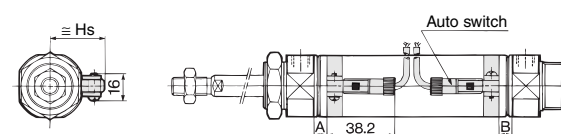
D-G5NTL



D-G39A
D-K39A



D-H7C



Proper Auto Switch Mounting Position/Spring Extend (T)

| Auto switch model | Bore size (mm) | A | B dimension | | | | |
|---|----------------|-----|-------------|-----------|------------|------------|------------|
| | | | Up to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 200 to 250 |
| D-B5 D-B6 | 20 | 1 | 25 | 50 | 75 | — | — |
| | 25 | 1 | 25 | 50 | 75 | — | — |
| | 32 | 2 | 26 | 51 | 76 | 101 | — |
| | 40 | 7 | 31 | 56 | 81 | 106 | 131 |
| D-C7□ D-C80 D-C73C D-C80C | 20 | 7 | 31 | 56 | 81 | — | — |
| | 25 | 7 | 31 | 56 | 81 | — | — |
| | 32 | 8 | 32 | 57 | 82 | 107 | — |
| | 40 | 13 | 37 | 62 | 87 | 112 | 137 |
| D-B59W | 20 | 4 | 28 | 53 | 78 | — | — |
| | 25 | 4 | 28 | 53 | 78 | — | — |
| | 32 | 5 | 29 | 54 | 79 | 104 | — |
| | 40 | 10 | 34 | 59 | 84 | 109 | 134 |
| D-A3□A D-G39A D-K39A D-A44A | 20 | 0.5 | 24.5 | 49.5 | 74.5 | — | — |
| | 25 | 0.5 | 24.5 | 49.5 | 74.5 | — | — |
| | 32 | 1.5 | 25.5 | 50.5 | 75.5 | 100.5 | — |
| | 40 | 6.5 | 30.5 | 55.5 | 80.5 | 105.5 | 130.5 |
| D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | 20 | 6 | 30 | 55 | 80 | — | — |
| | 25 | 6 | 30 | 55 | 80 | — | — |
| | 32 | 7 | 31 | 56 | 81 | 106 | — |
| | 40 | 12 | 36 | 61 | 86 | 111 | 136 |
| D-G5NTL | 20 | 2.5 | 26.5 | 51.5 | 76.5 | — | — |
| | 25 | 2.5 | 26.5 | 51.5 | 76.5 | — | — |
| | 32 | 3.5 | 27.5 | 52.5 | 77.5 | 102.5 | — |
| | 40 | 8.5 | 32.5 | 57.5 | 81.5 | 107.5 | 132.5 |

Auto Switch Mounting Height

| Auto switch model | Bore size (mm) | Hs |
|---|----------------|------|
| D-B5/B6 D-B59W D-G5NTL | 20 | 25.5 |
| | 25 | 28 |
| | 32 | 31.5 |
| | 40 | 35.5 |
| D-C7/C8 D-H7□ D-H7□W D-H7BAL D-H7NF | 20 | 22.5 |
| | 25 | 25 |
| | 32 | 28.5 |
| | 40 | 32.5 |
| D-C73C D-C80C D-H7C | 20 | 25 |
| | 25 | 27.5 |
| | 32 | 31 |
| | 40 | 35 |
| D-A3□A D-G39A D-K39A | 20 | 60 |
| | 25 | 62.5 |
| | 32 | 66 |
| | 40 | 70 |
| D-A44A | 20 | 69.5 |
| | 25 | 72 |
| | 32 | 75.5 |
| | 40 | 79.5 |

For the operating range of auto switch, refer to page 6-4-24.

Air Cylinder: Non-rotating Rod Type

Double Acting, Single Rod

Series CM2K

ø20, ø25, ø32, ø40



How to Order

Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-54.)

Cushion

| | |
|------------|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

Without auto switch

CM2K **L** **40** — **150** **A** **J**

With auto switch

CDM2K **L** **40** — **150** **A** **J** — **H7BW**

Bore size

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
| S | 1 pc. |
| n | "n" pcs. |

Built-in magnet

| | |
|------------|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|--------------|-------------------|-----------------------|-------|-------|----------|--------------------|-----------------|---|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | C76 | ● | ● | — | — | — | IC circuit | — |
| | | Connector | | 2-wire | 24 V | 12 V | C73 | ● | ● | ● | — | — | Relay, PLC | — |
| | | Terminal conduit | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | |
| | | DIN terminal | | | | — | C73C | ● | ● | ● | ● | — | | |
| | Diagnostic indication (2-color indication) | Grommet | | | | 100 V, 200 V | A33A | — | — | — | ● | — | Relay, PLC | — |
| | | Grommet | | | | — | A34A | — | — | — | ● | — | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | A44A | — | — | — | ● | — | Relay, PLC | — |
| | | Connector | | 3-wire (PNP) | | — | B59W | ● | ● | — | — | — | | |
| | | Terminal conduit | | 2-wire | | 12 V | H7A1 | ● | ● | ○ | — | ○ | | |
| | | Terminal conduit | | 2-wire | | 12 V | H7A2 | ● | ● | ○ | — | ○ | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | H7B | ● | ● | ○ | — | ○ | IC circuit | — |
| | | Grommet | | 2-wire | | 12 V | H7C | ● | ● | ● | ● | — | | |
| | | Grommet | | 3-wire (NPN) | | 5 V, 12 V | G39A | — | — | — | ● | — | | |
| | | Grommet | | 2-wire | | 12 V | K39A | — | — | — | ● | — | | |
| | Water resistant (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | H7NW | ● | ● | ○ | — | ○ | IC circuit | — |
| | | Grommet | | 3-wire (PNP) | | 5 V, 12 V | H7PW | ● | ● | ○ | — | ○ | | |
| | | Grommet | | 2-wire | | 12 V | H7BW | ● | ● | ○ | — | ○ | | |
| | | Grommet | | 2-wire | | 12 V | H7BA | — | ● | ○ | — | ○ | | |
| | With diagnostic output (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | H7NF | ● | ● | ○ | — | ○ | IC circuit | — |

* Lead wire length symbols: 0.5 m Nil
 3 m L
 5 m Z
 None N

(Example) C73C
 (Example) C73CL
 (Example) C73CZ
 (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
 ** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2K

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy

ø20, ø25—±0.7°

ø32, ø40—±0.5°

Can operate without lubrication.

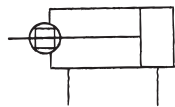
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Double acting,
Single rod



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB12 | External stainless steel cylinder |
| -XC3 | Special port location |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC8 | Adjustable stroke cylinder/Adjustable extension type |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC10 | Dual stroke cylinder/Double rod type |
| -XC11 | Dual stroke cylinder/Single rod type |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC20 | Head cover axial port |
| -XC22 | Fluoro rubber seals |
| -XC27 | Double clevis pin and double knuckle pin made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC52 | Mounting nut with set screw |

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Rod non-rotating accuracy | ±0.7° | | ±0.5° | |
| Type | Pneumatic | | | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Cushion | Rubber bumper | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.05 MPa | | | |
| Ambient and fluid temperature | Without auto switch: −10 to 70°C (No freezing) With auto switch: −10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $\begin{smallmatrix} +1.4 \\ 0 \end{smallmatrix}$ mm | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke ^{Note)} (mm) |
|----------------|--|
| 20 | 25, 50, 75, 100, 125, 150 200, 250, 300 |
| 25 | |
| 32 | |
| 40 | |



Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) The maximum limit is 1000 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Minimum Stroke for Auto Switch Mounting

Auto switches can be mounted.
For minimum stroke table, refer to page 6-4-5.

Rod Boot Material

| Symbol | Rod boot material | Max. ambient temperature |
|--------|--------------------------|--------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C * |

* Maximum ambient temperature for the rod boot itself.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|----------------------------|----------|----------|----------|----------|
| Axial foot* | CM-L020B | CM-L032B | CM-L040B | CM-L040B |
| Flange | CM-F020B | CM-F032B | CM-F040B | CM-F040B |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | CM-C040B |
| Double clevis (With pin)** | CM-D020B | CM-D032B | CM-D040B | CM-D040B |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | CM-T040B |

* Two foot brackets and a mounting nut are attached. Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size ø40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



* Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod **Series CM2K**

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type)

(mm)

| ø20 | ø25 | ø32 | ø40 |
|-----|-----|-----|-----|
| ▲13 | ▲13 | ▲13 | ▲16 |

Mounting style

- Boss-cut basic style (BZ) ■ Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

- Do not rotate the cover.**
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.
- Do not operate with the cushion needle in a fully closed condition.**
Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".
- Do not open the cushion needle wide excessively.**
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.

⚠ Caution

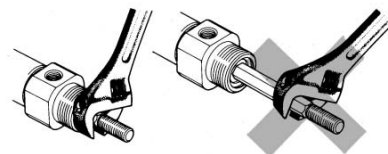
- Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.**

If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy. Refer to the table below for the approximate values of the allowable range of rotational torque.

| Allowable rotational torque (N·m or less) | ø20 | ø25 | ø32 | ø40 |
|--|-----|------|------|------|
| | 0.2 | 0.25 | 0.25 | 0.44 |

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.

Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



- When replacing rod seals, please contact SMC.**
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.
- Not able to disassemble.**
Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.
- Do not touch the cylinder during operation.**
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.
- Combine the rod end section, so that a rod boot might not be twisted.**
If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

Calculation: (Example) CM2KL32-100

- Basic weight.....0.44 (Foot style, ø32)
- Additional weight.....0.09/0.50 stroke
- Cylinder stroke.....100 stroke
 $0.44 + 0.09 \times 100/50 = 0.62 \text{ kg}$

Mounting Style and Accessory

| Accessory | Standard equipment | | | Option | | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------|----------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis bracket ⁽⁴⁾ | Rod boot |
| Mounting | | | | | | | |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — | ● |
| Axial foot style | ● (2) | ● | — | ● | ● | — | ● |
| Rod side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Head side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — | ● |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — | ● |
| Rod side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — | ● |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — | ● |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — | ● |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — | ● |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — | ● |

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.14 | 0.21 | 0.28 | 0.57 |
| | Axial foot style | 0.29 | 0.37 | 0.44 | 0.84 |
| | Flange style | 0.20 | 0.30 | 0.37 | 0.69 |
| | Clevis integrated style | 0.12 | 0.19 | 0.27 | 0.53 |
| | Single clevis style | 0.18 | 0.25 | 0.32 | 0.66 |
| | Double clevis style | 0.19 | 0.27 | 0.33 | 0.70 |
| | Trunnion style | 0.18 | 0.28 | 0.34 | 0.67 |
| | Boss-cut basic style | 0.13 | 0.19 | 0.26 | 0.53 |
| | Boss-cut flange style | 0.19 | 0.28 | 0.35 | 0.66 |
| | Boss-cut trunnion style | 0.17 | 0.26 | 0.32 | 0.63 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.07 | 0.09 | 0.14 |
| Option bracket | Clevis bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Series CM2K

Copper-free

20-CM2K Mounting style Bore size Stroke

• Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.



Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper |
| Piston speed | 50 to 500 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Head side trunnion style, Rod side trunnion style, Clevis integrated style, Boss-cut style |

With Air Cushion

CM2K Mounting style Bore size Stroke A

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.



Specifications

| | |
|-------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Air cushion |
| Piston speed | 50 to 500 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style |

* Auto switch can be mounted.

Allowable Kinetic Energy

| Bore size (mm) | Effective cushion length (mm) | Kinetic energy absorbable (J) |
|----------------|-------------------------------|-------------------------------|
| 20 | 11.0 | 0.54 |
| 25 | 11.0 | 0.78 |
| 32 | 11.0 | 1.27 |
| 40 | 11.8 | 2.35 |

- For construction, refer to page 6-4-57.
- Since the dimensions of mounting style is the same as page 6-4-58, refer to those pages.
- For other specifications, refer to page 6-4-54.

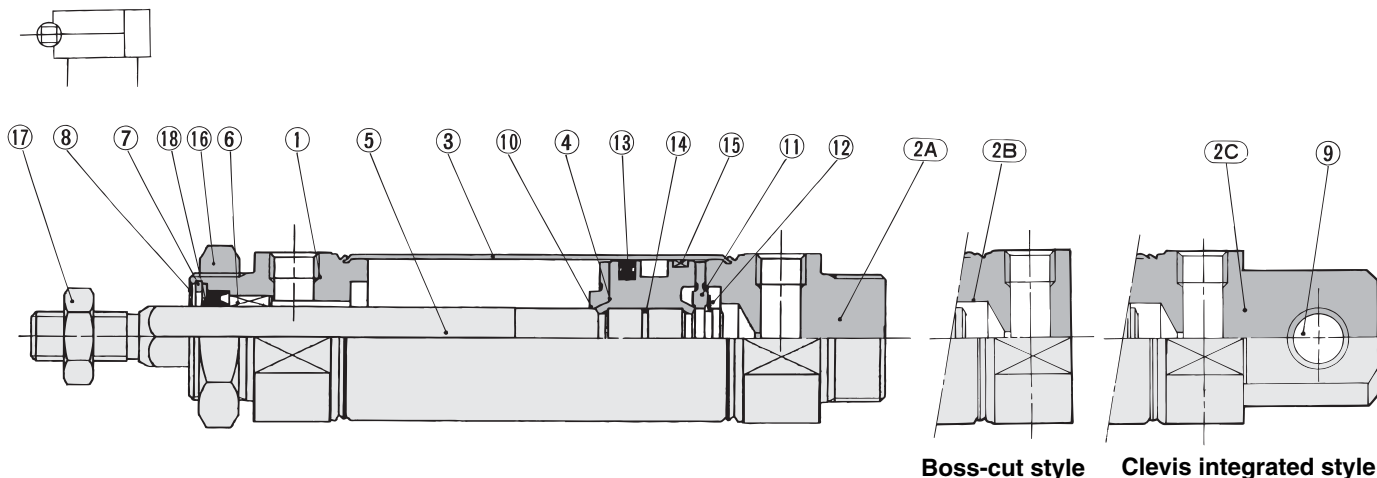
Proper Auto Switch Mounting Position and Operating Range

For the standard type (double acting, single rod), refer to page 6-4-24.

Air Cylinder: Non-rotating Rod Type Double Acting, Single Rod **Series CM2K**

Construction

Rubber bumper

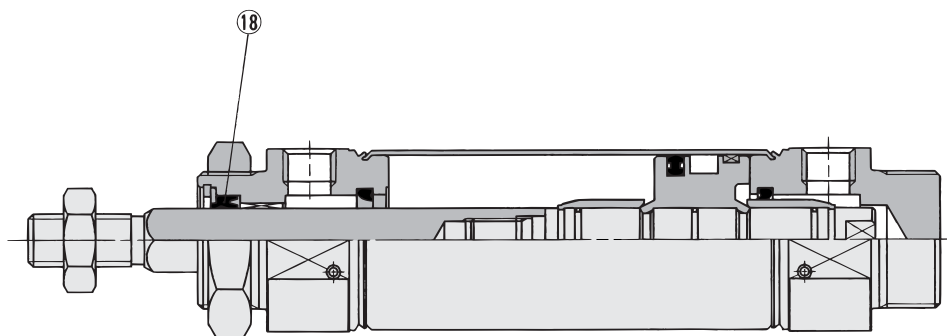
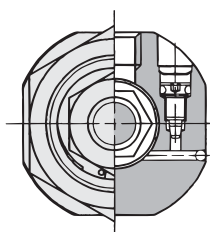


Boss-cut style Clevis integrated style



Rod section

With air cushion



Rod section

Component Parts

| No. | Description | Material | Note |
|-----|--------------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ②A | Head cover A | Aluminum alloy | Clear anodized * |
| ②B | Head cover B | Aluminum alloy | Clear anodized ** |
| ②C | Head cover B | Aluminum alloy | Clear anodized *** |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Stainless steel | |
| ⑥ | Non-rotating guide | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Clevis bushing | Oil-impregnated sintered alloy | |
| ⑩ | Bumper A | Urethane | |
| ⑪ | Bumper B | Urethane | |

* Basic style, ** Boss-cut style, *** Clevis integrated style

| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ⑫ | Snap ring | Stainless steel | |
| ⑬ | Piston seal | NBR | |
| ⑭ | Piston gasket | NBR | |
| ⑮ | Wear ring | Resin | |
| ⑯ | Mounting nut | Carbon steel | Nickel plated |
| ⑰ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts: With Rubber Bumper, With Air Cushion

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|---------|---------|
| | | | 20 | 25 | 32 | 40 |
| ⑱ | Rod seal | NBR | PDR-8W | PDR-10W | PDR-12W | PDR-14W |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

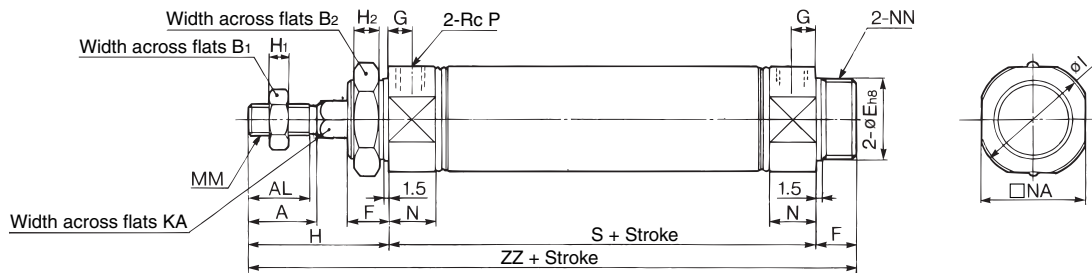
20-

Data

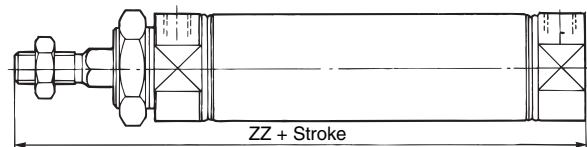
Series CM2K

Basic Style (B)

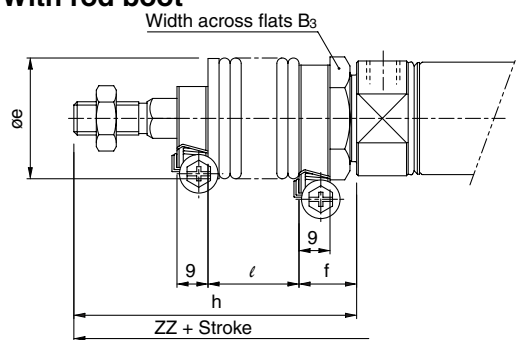
CM2KB Bore size — Stroke



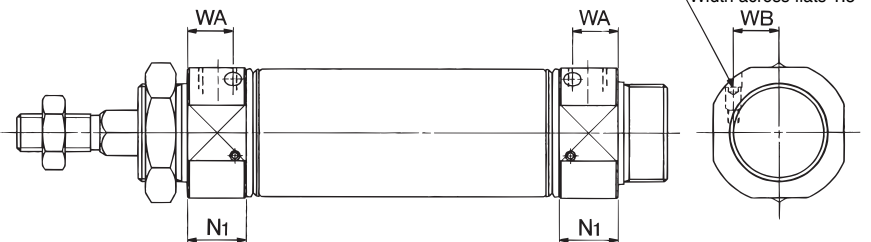
Boss-cut style



With rod boot



With air cushion



| Bore size (mm) | A | AL | B1 | B2 | E | F | G | H | H1 | H2 | I | KA | MM | N | NA | NN | P | S | ZZ |
|----------------|----|------|----|----|-----------------------------------|----|----|----|----|----|------|------|------------|------|------|-----------|-----------------------------|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 8.2 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | ¹ / ₈ | 62 | 116 |
| 25 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 10.2 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | ¹ / ₈ | 62 | 120 |
| 32 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 12.2 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | ¹ / ₈ | 64 | 122 |
| 40 | 24 | 21 | 22 | 41 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 10 | 46.5 | 14.2 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | ¹ / ₄ | 88 | 154 |

With Rod Boot

| Symbol Bore size (mm) Stroke | B3 | e | f | h | | | | | | ℓ | | | | | ZZ | | | | |
|------------------------------------|----|----|----|---------|-----------|------------|------------|------------|--|---------|-----------|------------|------------|------------|---------|-----------|------------|------------|------------|
| | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | | 12.5 | 25 | 37.5 | 50 | 75 | 143 | 156 | 168 | 181 | 206 |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | | 12.5 | 25 | 37.5 | 50 | 75 | 147 | 160 | 172 | 185 | 210 |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | | 12.5 | 25 | 37.5 | 50 | 75 | 149 | 162 | 174 | 187 | 212 |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | | 12.5 | 25 | 37.5 | 50 | 75 | 181 | 194 | 206 | 219 | 244 |

Boss-cut Style

| Bore size (mm) | ZZ | | | | | |
|----------------|------------------|---------------|-----------|------------|------------|------------|
| | Without rod boot | With rod boot | | | | |
| | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 |
| 20 | 103 | 130 | 143 | 155 | 168 | 193 |
| 25 | 107 | 134 | 147 | 159 | 172 | 197 |
| 32 | 109 | 136 | 149 | 161 | 174 | 199 |
| 40 | 138 | 165 | 178 | 190 | 203 | 228 |

With Air Cushion

| Bore size (mm) | N1 | WA | WB |
|----------------|------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Dimensions of Each Mounting Bracket

The dimensions are the same as standard type, double acting, single rod, except the configuration of the piston rod. Refer to pages 6-4-13 to 6-4-20. Specifications for the auto switch equipped type are the same as Series CDM2 standard type.

Air Cylinder: Non-rotating Rod Type

Double Acting, Double Rod

Series CM2KW

ø20, ø25, ø32, ø40

How to Order



Mounting style

| | |
|---|------------------|
| B | Basic style |
| L | Axial foot style |
| F | Flange style |
| U | Trunnion style |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-60.)

Cushion

| | |
|-----|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

Without auto switch CM2KW L 40 150 A

With auto switch CDM2KW L 40 150 A H7BW

Built-in magnet

Non-rotating rod type

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--|---|------------------|-----------------|-------------------------|--------------|--------------|-------------------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | |
| | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | | |
| | | | | | | — | C73C | ● | ● | ● | — | — | | | |
| | | | | | | — | A33A | — | — | — | ● | — | | | |
| | 100 V, 200 V | | | | | A34A | — | — | — | ● | — | | | | |
| | A44A | — | | — | — | ● | — | Relay, PLC | | | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | | — | — | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | |
| | | 2-wire | | H7B | | | | ● | ● | ○ | — | ○ | | | |
| | | Connector | | H7C | | | | ● | ● | ● | ● | — | | | |
| | | | | 3-wire (NPN) | | | | 5 V, 12 V | G39A | — | — | — | ● | — | |
| | Diagnostic indication (2-color indication) | Grommet | | 2-wire | | 12 V | | K39A | — | — | — | ● | — | — | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | | | H7PW | ● | ● | ○ | — | ○ | | |
| | | | | 2-wire | | | | H7BW | ● | ● | ○ | — | ○ | | |
| | | | | | | | | 12 V | H7BA | — | ● | ○ | — | ○ | |
| | With diagnostic output (2-color indication) | 3-wire (NPN) | | 5 V, 12 V | | H7NF | | ● | ● | ○ | — | ○ | IC circuit | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2KW

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy

ø20, ø25—±0.7°

ø32, ø40—±0.5°

Can operate without lubrication.

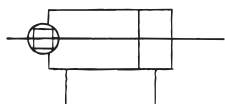
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Double acting,
Double rod



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XB6 | Heat resistant cylinder (150°C) |
| -XC3 | Special port location |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC22 | Fluoro rubber seals |
| -XC29 | Double knuckle joint with spring pin |
| -XC52 | Mounting nut with set screw |

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Rod non-rotating accuracy | ±0.7° | | ±0.5° | |
| Action | Pneumatic | | | |
| Cushion | Rubber bumper | | | |
| Action | Double acting, Double rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.08 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $\begin{smallmatrix} +1.4 \\ 0 \end{smallmatrix}$ mm | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke ^{Note)} (mm) |
|----------------|---------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150 |
| 25 | |
| 32 | |
| 40 | 200, 250, 300 |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) The maximum limit is 500 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Accessory Bracket

Refer to page 6-4-21 for accessory bracket, since it is the same as standard type, double acting, single rod.

Minimum Stroke for Auto Switch Mounting

(mm)

| Auto switch model | No. of auto switches mounted | | | | 1 |
|--------------------------------------|------------------------------|-----------|---|-------------------|----|
| | 2 | | n | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | 15 + 45 ($\frac{n-2}{2}$) (n = 2, 4, 6...) | 50 + 45 (n – 2) | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | 60 + 45 (n – 2) | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | 15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...) | 65 + 50 (n – 2) | 10 |
| D-B5/B6 D-G5NTL | 15 | 75 | 15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...) | 75 + 55 (n – 2) | 10 |
| D-B59W | 20 | 75 | 20 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6...) | | 15 |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | 35 + 30 (n – 2) | 100 + 100 (n – 2) | 10 |

Mounting Style and Accessory

| Accessories | Standard equipment | | Option | |
|------------------|----------------------|-------------|----------------------|-------------------------------------|
| | Mounting nut | Rod end nut | Single knuckle joint | Double knuckle joint ⁽²⁾ |
| Mounting | | | | |
| Basic style | ● (1 pc.) | ● (2 pcs.) | ● | ● |
| Axial foot style | ● (2) | ● (2) | ● | ● |
| Flange style | ● (1) | ● (2) | ● | ● |
| Trunnion style | ● (1) ⁽¹⁾ | ● (2) | ● | ● |

Note 1) Trunnion nuts are attached for trunnion style.

Note 2) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Air Cylinder: Non-rotating Rod Type Double Acting, Double Rod **Series CM2KW**

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.16 | 0.25 | 0.32 | 0.66 |
| | Axial foot style | 0.31 | 0.41 | 0.48 | 0.93 |
| | Flange style | 0.22 | 0.34 | 0.41 | 0.78 |
| | Trunnion style | 0.20 | 0.32 | 0.38 | 0.76 |
| Additional weight per each 50 mm of stroke | | 0.06 | 0.1 | 0.14 | 0.20 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2KWL32-100

- Basic weight..... 0.48 (Foot, ø32)
- Additional weight..... 0.14/50 st
- Cylinder stroke: 100 st

$$0.48 + 0.14 \times 100/50 = 0.76 \text{ kg}$$


Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|----------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Trunnion (With nuts) | CM-T020B | CM-T032B | CM-T040B | |

* Two foot brackets and a mounting nut are attached.
Order two foot brackets per cylinder.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G3/K3 | BM3-020 | BM3-025 | BM3-032 | BM3-040 |

 Mounting screws set made of stainless steel
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.
(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5
BBA4: For D-C7/C8/H7

- "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.
When only a switch is shipped independently, "BBA4" screws are attached.

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

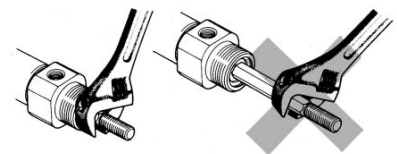
- 1. Do not rotate the cover.**
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.
- 2. Do not operate with the cushion needle in a fully closed condition.**
Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".
- 3. Do not open the cushion needle wide excessively.**
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.

⚠ Caution

- 1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.**
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

| Allowable rotational torque (N·m or less) | ø20 | ø25 | ø32 | ø40 |
|---|-----|------|------|------|
| | 0.2 | 0.25 | 0.25 | 0.44 |

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.
Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



- 2. When replacing rod seals, please contact SMC.**
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.
- 3. Not able to disassemble.**
Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.
- 4. Do not touch the cylinder during operation.**
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.
- 5. Combine the rod end section, so that a rod boot might not be twisted.**
If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2KW

With Air Cushion

CM2KW Mounting style Bore size Stroke A Rod boot

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications and allowable kinetic energy, are the same as double acting, single rod type. Refer to page 6-4-8.

Copper-free

20-CM2KW Mounting style Bore size Stroke

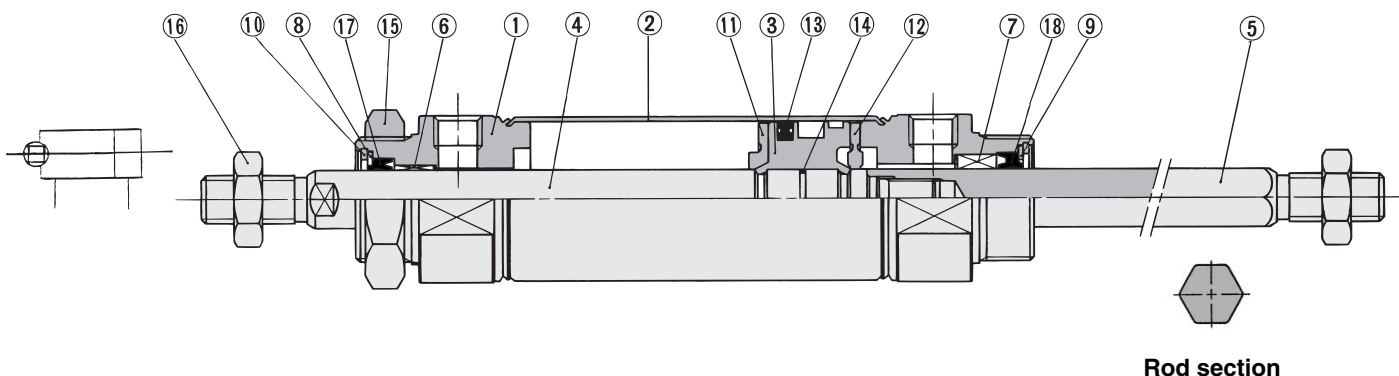
Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

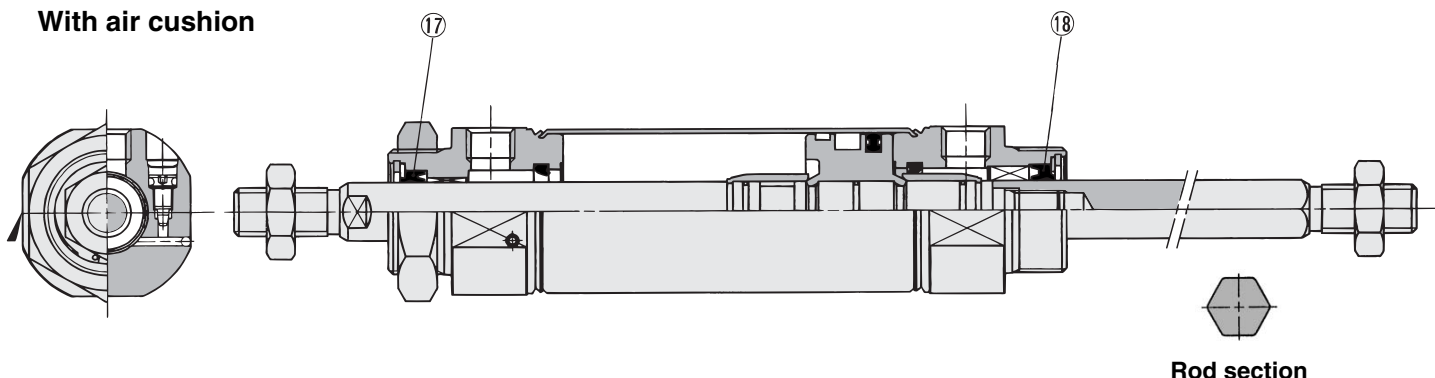
Specifications are the same as double acting, single rod type. Refer to page 6-4-5.

Construction

Rubber bumper



With air cushion



Component Parts

| No. | Description | Material | Note |
|-----|--------------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Cylinder tube | Stainless steel | |
| ③ | Piston | Aluminum alloy | Chromated |
| ④ | Piston rod A | Carbon steel | Hard chrome plated |
| ⑤ | Piston rod B | Stainless steel | |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Non-rotating guide | Oil-impregnated sintered alloy | |
| ⑧ | Seal retainer A | Rolled steel plate | Nickel plated |
| ⑨ | Seal retainer B | Rolled steel plate | Nickel plated |
| ⑩ | Snap ring | Carbon steel | Nickel plated |
| ⑪ | Bumper A | Urethane | |
| ⑫ | Bumper B | Urethane | |
| ⑬ | Piston seal | NBR | |
| ⑭ | Piston gasket | NBR | |
| ⑮ | mounting nut | Carbon steel | Nickel plated |
| ⑯ | Rod end nut | Carbon steel | Nickel plated |

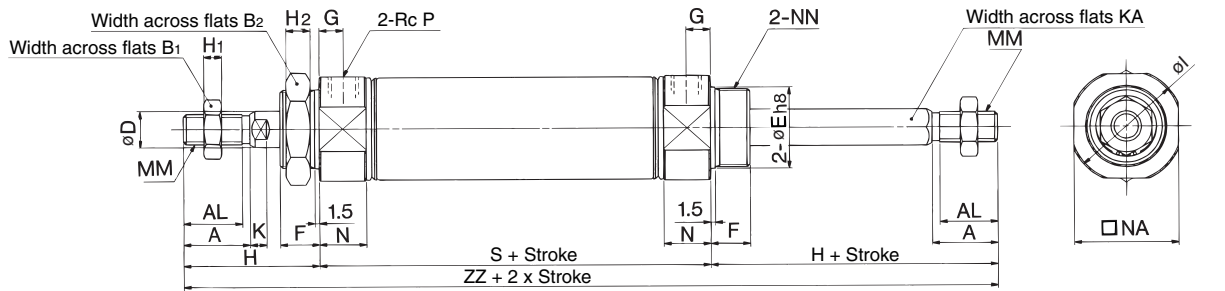
Replacement Parts: With Rubber Bumper, With Air Cushion, Built-in One-touch Fittings

| No. | Description | Material | Bore size (mm) | | | |
|-----|-------------|----------|----------------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ⑰ | Rod seal A | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |
| ⑱ | Rod seal B | NBR | PDR-8W | PDR-10W | PDR-12W | PDR-14W |

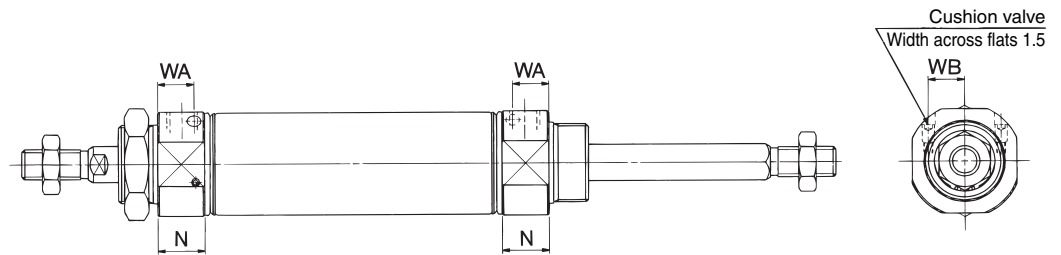
Air Cylinder: Non-rotating Rod Type Double Acting, Double Rod **Series CM2KW**

Basic Style (B)

CM2KWB **Bore size** — **Stroke**



With air cushion



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | H ₂ | I | K | KA | MM | N | NA | NN | P | S | ZZ |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|----------------|------|-----|------|------------|------|------|-----------|-----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 5 | 8.2 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 144 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | 10.2 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 152 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | 12.2 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 154 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.033} | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | 14.2 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 188 |

With Air Cushion

| Bore size (mm) | N | WA | WB |
|----------------|------|----|------|
| 20 | 17.5 | 13 | 8.5 |
| 25 | 17.5 | 13 | 10.5 |
| 32 | 17.5 | 13 | 11.5 |
| 40 | 21.5 | 16 | 15 |

Dimensions of Each Mounting Bracket

External dimensions of each mounting bracket other than basic style are the same as standard type, double acting, double rod (except KA dimensions). Refer to pages 6-4-21 to 6-4-22.

Proper Auto Switch Mounting Position and Operating Range

Refer to page 6-4-35 for the proper auto switch mounting position (at stroke end), since the operating range is the same as standard type, double acting, double rod.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Air Cylinder: Non-rotating Rod Type

Single Acting, Single Rod, Spring Return/Extend

Series CM2K

ø20, ø25, ø32, ø40

How to Order



Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-65.)

Action

| | |
|----------|------------------------------|
| S | Single acting, Spring return |
| T | Single acting, Spring extend |

Without auto switch **CM2K** **L** **32** — **150** **S**

With auto switch **CDM2K** **L** **32** — **150** **S** — **H7BW**

Built-in magnet **Bore size**

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | | |
|--|--|------------------|-----------------|---|--------------|-----------|-------------------|------------------------|-----------|------------|----------|--------------------|-----------------|------------|------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | Relay, PLC | | |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | | | | |
| | | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | | | |
| | | | | | | | — | C73C | ● | ● | ● | ● | — | | | | |
| | | | | | | | — | A33A | — | — | — | ● | — | | | | |
| | 100 V, 200 V | A34A | | | | | — | — | — | ● | — | | | | | | |
| | DIN terminal | A44A | | | | | — | — | — | ● | — | | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | — | Relay, PLC | | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | | | |
| | | Connector | | 2-wire | | | | 12 V | H7B | ● | ● | ○ | — | ○ | | | |
| | | | | H7C | | | | ● | ● | ● | ● | — | | | | | |
| | Terminal conduit | 3-wire (NPN) | | 5 V, 12 V | | | | G39A | — | — | — | ● | — | IC circuit | | | |
| | | 2-wire | | 12 V | | | | K39A | — | — | — | ● | — | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | | | 5 V, 12 V | H7NW | ● | ● | ○ | — | ○ | | IC circuit | |
| | | | | 3-wire (PNP) | | | | H7PW | ● | ● | ○ | — | ○ | | | | |
| | 2-wire | | | H7BW | | | | ● | ● | ○ | — | ○ | — | | | | |
| | | | | H7BA | | | | — | ● | ○ | — | ○ | | | | | |
| | Water resistant (2-color indication) | | | With diagnostic output (2-color indication) | | | | 3-wire (NPN) | 5 V, 12 V | H7NF | ● | ● | ○ | — | | ○ | IC circuit |

* Lead wire length symbols: 0.5 m Nil
3 m L
5 m Z
None N

(Example) C73C
(Example) C73CL
(Example) C73CZ
(Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Non-rotating Rod type Single Acting, Single Rod, Spring Return/Extend **Series CM2K**

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy

ø20, ø25— $\pm 0.7^\circ$

ø32, ø40— $\pm 0.5^\circ$

Can operate without lubrication.

The same installation dimensions as the standard cylinder.

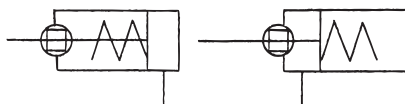
Auto switches can also be mounted.

It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Single acting,
Spring return

Spring extend



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XC3 | Special port location |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC13 | Auto switch mounting rail style |
| -XC18 | NPT finish piping port |
| -XC20 | Head cover axial port |
| -XC27 | Double clevis pin and double knuckle pin made of stainless steel |
| -XC29 | Double knuckle joint with spring pin |
| -XC52 | Mounting nut with set screw |

⚠ Precautions

**Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.**

Specifications

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|-------------------------------|---------------|---|-------|--------|-------|
| Rod non-rotating accuracy | | ±0.7 | | 0.5 | |
| Action | | Spring acting, Spring return/Spring extend | | | |
| Fluid | | Air | | | |
| Cushion | | Rubber bumper | | | |
| Proof pressure | | 1.5 MPa | | | |
| Maximum operating pressure | | 1.0 MPa | | | |
| Minimum operating pressure | Spring return | 0.18 MPa | | | |
| | Spring extend | 0.23 MPa | | | |
| Ambient and fluid temperature | | Without auto switch: −10 to 70°C (No freezing) With auto switch: −10 to 60°C (No freezing) | | | |
| Lubrication | | Not required (Non-lube) | | | |
| Thread tolerance | | JIS Class 2 | | | |
| Stroke length tolerance | | +1.4 0 mm | | | |
| Piston speed | | 50 to 500 mm/s | | | |
| Rod non-rotating accuracy | | ±0.7° | | ±0.5° | |
| Allowable kinetic energy | | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) <small>Note)</small> |
|----------------|---|
| 20 | 25, 50, 75, 100, 125, 150 |
| 25 | 25, 50, 75, 100, 125, 150 |
| 32 | 25, 50, 75, 100, 125, 150, 200 |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250 |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) Please contact SMC for longer strokes.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-4-5, since it is the same as standard type.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis (With pin) ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |

* Two foot brackets and a mounting nut are attached.

Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size 40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Theoretical Output

Refer to "Theoretical Output 1" on page 6-19-7.

Spring Reaction Force

Refer to "Spring Reaction Force 2" on page 6-19-3.

Series CM2K

Mounting Style and Accessory

| Accessory | Standard equipment | | | Option | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double knuckle joint ⁽³⁾ | Clevis bracket ⁽⁴⁾ |
| Mounting | | | | | | |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — |
| Axial foot style | ● (2) | ● | — | ● | ● | — |
| Rod side flange style | ● (1) | ● | — | ● | ● | — |
| Head side flange style | ● (1) | ● | — | ● | ● | — |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — |
| Rod side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — |

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

Spring Return/(): Denotes Spring Extend.

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|-------------------------|---------------------------------|--------------|--------------|--------------|--------------|
| Basic weight | 25 stroke | 0.20(0.19) | 0.31(0.30) | 0.43(0.41) | 0.78(0.75) |
| | 50 stroke | 0.23(0.21) | 0.34(0.33) | 0.48(0.45) | 0.86(0.83) |
| | 75 stroke | 0.29(0.25) | 0.43(0.41) | 0.61(0.56) | 1.08(0.99) |
| | 100 stroke | 0.31(0.27) | 0.47(0.44) | 0.66(0.60) | 1.14(1.06) |
| | 125 stroke | 0.37(0.32) | 0.56(0.52) | 0.81(0.72) | 1.34(1.23) |
| | 150 stroke | 0.39(0.34) | 0.59(0.55) | 0.85(0.76) | 1.39(1.31) |
| | 200 stroke | —(—) | —(—) | 1.04(0.92) | 1.71(1.54) |
| | 250 stroke | —(—) | —(—) | —(—) | 2.00(1.78) |
| Mounting bracket weight | Foot style | 0.15(0.15) | 0.16(0.16) | 0.16(0.16) | 0.27(0.27) |
| | Flange style | 0.06(0.06) | 0.09(0.09) | 0.09(0.09) | 0.12(0.12) |
| | Single clevis style | 0.04(0.04) | 0.04(0.04) | 0.04(0.04) | 0.09(0.09) |
| | Double clevis style | 0.05(0.05) | 0.06(0.06) | 0.06(0.06) | 0.13(0.13) |
| | Trunnion style | 0.04(0.04) | 0.07(0.07) | 0.07(0.07) | 0.10(0.10) |
| | Integral clevis style | −0.02(−0.02) | −0.02(−0.02) | −0.01(−0.01) | −0.04(−0.04) |
| | Boss-cut basic style | −0.01(−0.01) | −0.02(−0.02) | −0.02(−0.02) | −0.03(−0.03) |
| | Boss-cut flange style | 0.05(0.05) | 0.07(0.07) | 0.07(0.07) | 0.09(0.09) |
| | Boss-cut trunnion style | 0.03(0.03) | 0.05(0.05) | 0.05(0.05) | 0.07(0.07) |
| | Clevis bracket (With pin) | 0.07(0.07) | 0.07(0.07) | 0.14(0.14) | 0.14(0.14) |
| Option bracket | Single knuckle joint | 0.06(0.06) | 0.06(0.06) | 0.06(0.06) | 0.23(0.23) |
| | Double knuckle joint (With pin) | 0.07(0.07) | 0.07(0.07) | 0.07(0.07) | 0.20(0.20) |

Calculation:

(Example) CM2KL32-100S (Bore size ø32, Foot style, 100 stroke)

0.66 (Basic weight) + 0.16 (Mounting bracket weight) = 0.82 kg

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type) (mm)

| ø20 | ø25 | ø32 | ø40 |
|------|------|------|------|
| ▲ 13 | ▲ 13 | ▲ 13 | ▲ 16 |

Mounting style

- Boss-cut basic style (BZ)
- Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

Proper Auto Switch Mounting

Refer to page 6-4-51 to 6-4-52 for the proper auto switch mounting position (at stroke end), since the operating range is the same as standard type, single acting, spring return/spring extend.

Air Cylinder: Non-rotating Rod type

Single Acting, Single Rod, Spring Return/Extend **Series CM2K**

Copper-free

20-CM2K **Mounting style** **Bore size** **Stroke** **Action**

• Copper-free

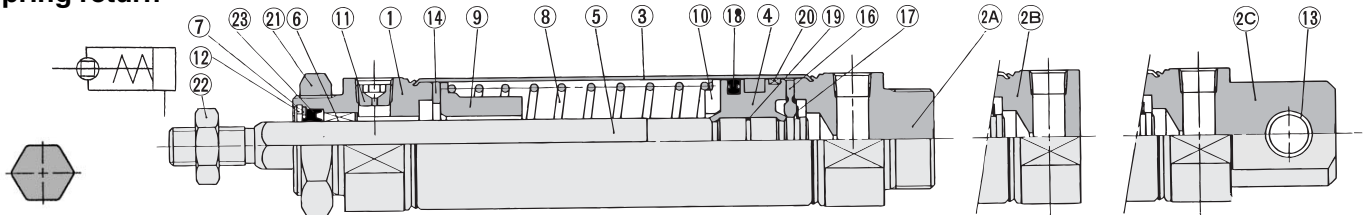
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

| Action | Single acting, Spring return | Single acting, Spring extend |
|-------------------------|--|------------------------------|
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.18 MPa | 0.23 MPa |
| Cushion | Rubber bumper | |
| Piston speed | 50 to 500 mm/s | |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style | |

Construction

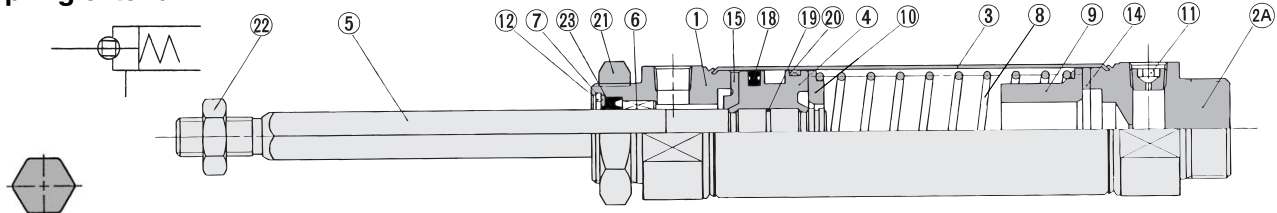
Spring return



Rod section

Clevis integrated style

Spring extend



Rod section

Component Parts

| No. | Description | Material | Note |
|-----|-------------------------|--------------------------------|----------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ②A | Head cover A | Aluminum alloy | Clear anodized * |
| ②B | Head cover B | Aluminum alloy | Clear anodized ** |
| ②C | Head cover B | Aluminum alloy | Clear anodized *** |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Stainless steel | |
| ⑥ | Non-rotating guide | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Return spring | Steel wire | Zinc chromated |
| ⑨ | Spring guide | Aluminum alloy | Chromated |
| ⑩ | Spring seat | Aluminum alloy | Chromated |
| ⑪ | Plug with fixed orifice | Alloy steel | Black zinc chromated |

* Basic style, ** Boss-cut style, *** Clevis integrated style

| No. | Description | Material | Note |
|-----|----------------|--------------------------------|---------------|
| ⑫ | Snap ring | Carbon steel | Nickel plated |
| ⑬ | Clevis bushing | Oil-impregnated sintered alloy | |
| ⑭ | Bumper | Urethane | |
| ⑮ | Bumper A | Urethane | |
| ⑯ | Bumper B | Urethane | |
| ⑰ | Snap ring | Stainless steel | |
| ⑱ | Piston seal | NBR | |
| ⑲ | Piston gasket | NBR | |
| ⑳ | Wear ring | Resin | |
| ㉑ | Mounting nut | Carbon steel | Nickel plated |
| ㉒ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts: With Rubber Bumper

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|---------|---------|
| | | | 20 | 25 | 32 | 40 |
| ㉓ | Rod seal | NBR | PDR-8W | PDR-10W | PDR-12W | PDR-14W |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

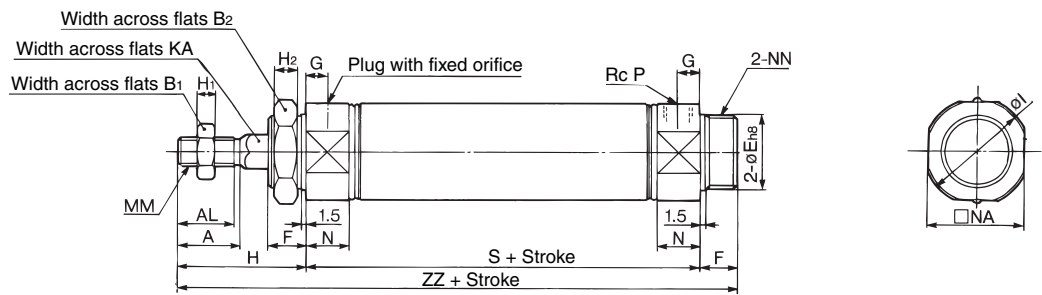
Data

Series CM2K

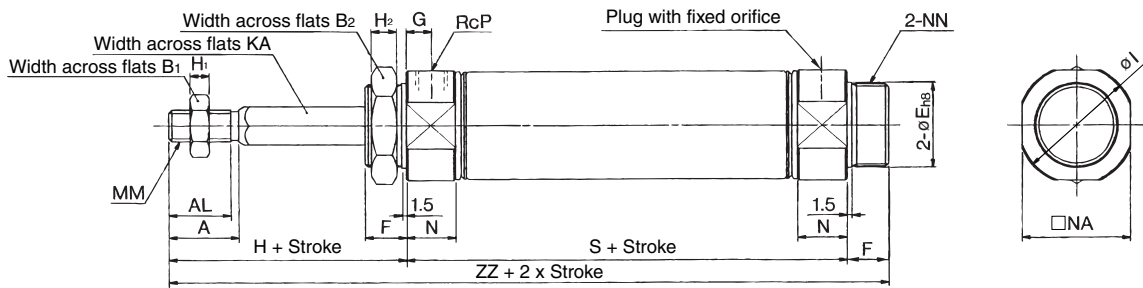
Basic Style (B)

CM2KB Bore size — Stroke $\frac{S}{T}$

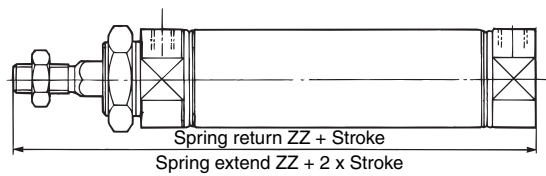
Spring return



Spring extend



Boss-cut style



| Bore size (mm) | A | AL | B ₁ | B ₂ | E | F | G | H | H ₁ | H ₂ | I | KA | MM | N | NA | NN | P |
|----------------|----|------|----------------|----------------|-----------------------------------|----|----|----|----------------|----------------|------|------|------------|------|------|-----------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 8.2 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 |
| 25 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 10.2 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 |
| 32 | 22 | 19.5 | 17 | 32 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 12.2 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 |
| 40 | 24 | 21 | 22 | 41 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 10 | 46.5 | 14.2 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 |

Dimensions by Stroke

| Bore size (mm) | 1 to 50 | | 51 to 100 | | 101 to 150 | | 151 to 200 | | 201 to 250 | |
|----------------|---------|-----|-----------|-----|------------|-----|------------|-----|------------|-----|
| | S | ZZ | S | ZZ | S | ZZ | S | ZZ | S | ZZ |
| 20 | 87 | 141 | 112 | 166 | 137 | 191 | — | — | — | — |
| 25 | 87 | 145 | 112 | 170 | 137 | 195 | — | — | — | — |
| 32 | 89 | 147 | 114 | 172 | 139 | 197 | 164 | 222 | — | — |
| 40 | 113 | 179 | 138 | 204 | 163 | 229 | 188 | 254 | 213 | 279 |

Boss-cut Style

| Bore size (mm) | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 250 |
|----------------|---------|-----------|------------|------------|------------|
| | ZZ | ZZ | ZZ | ZZ | ZZ |
| 20 | 128 | 153 | 178 | — | — |
| 25 | 132 | 157 | 182 | — | — |
| 32 | 134 | 159 | 184 | 209 | — |
| 40 | 163 | 188 | 213 | 238 | 263 |



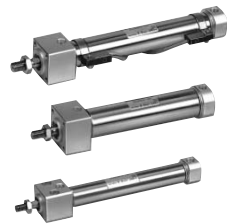
External dimensions of each mounting bracket other than basic style are the same as standard type, single acting, spring return/spring extend (except piston rod configuration). Refer to pages 6-4-43 to 6-4-50.
Specifications with auto switch are the same as standard type (CDM2- □S/T).

Air Cylinder: Direct Mount Type

Double Acting, Single Rod

Series CM2R

ø20, ø25, ø32, ø40



How to Order

Type

| | |
|-----|-----------|
| Nil | Pneumatic |
| H | Air-hydro |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-70.)

Cushion

| | |
|-----|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

* Air-hydro cylinder: Rubber bumper only

Without auto switch

With auto switch

CM2 H R A 20 — 100 A

CDM2 H R A 20 — 100 A H7BW

Built-in magnet

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Mounting style

| | |
|---|-----------------------|
| A | Bottom mounting style |
| B | Front mounting style |

Auto switch

| | |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-17-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|--------------|-------------------|------------------------|-------|-------|----------|--------------------|-----------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | C76 | ● | ● | — | — | — | IC circuit | — |
| | | Connector | | 2-wire | 24 V | 12 V | C73 | ● | ● | ● | — | — | — | Relay, PLC |
| | | Terminal conduit | | | | 100 V, 200 V | B54 ** | ● | ● | ● | — | — | | |
| | | DIN terminal | | | | — | C73C | ● | ● | ● | ● | — | | |
| | Diagnostic indication (2-color indication) | Grommet | | | | 100 V, 200 V | A33A ** | — | — | — | ● | — | — | Relay, PLC |
| | | Grommet | | | | — | A34A ** | — | — | — | ● | — | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | H7A1 | ● | ● | ○ | — | ○ | IC circuit | — |
| | | Connector | | 3-wire (PNP) | | 12 V | H7A2 | ● | ● | ○ | — | ○ | — | |
| | | Terminal conduit | | 2-wire | | 5 V, 12 V | H7B | ● | ● | ○ | — | ○ | — | |
| | | Grommet | | 3-wire (NPN) | | 12 V | H7C | ● | ● | ● | ● | — | — | |
| | | Connector | | 2-wire | | 5 V, 12 V | G39A ** | — | — | — | ● | — | IC circuit | |
| | | Terminal conduit | | 3-wire (NPN) | | 12 V | K39A ** | — | — | — | ● | — | — | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (PNP) | | 5 V, 12 V | H7NW | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | Connector | | 3-wire (PNP) | | 12 V | H7PW | ● | ● | ○ | — | ○ | — | |
| | | Terminal conduit | | 2-wire | | 12 V | H7BW | ● | ● | ○ | — | ○ | — | |
| | Water resistant (2-color indication) | Grommet | Yes | 2-wire | 24 V | 12 V | H7BA | — | ● | ○ | — | ○ | — | — |
| | | Connector | | 2-wire | | 12 V | H7NF | ● | ● | ○ | — | ○ | IC circuit | |
| | With diagnostic output (2-color indication) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | H7NF | ● | ● | ○ | — | ○ | IC circuit | — |

- * Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN
- * Solid state switches marked with "○" are produced upon receipt of order.
- * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
- ** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.
- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Series CM2R

Series CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

Space saving has been realized.

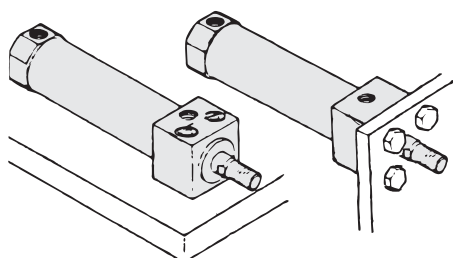
Because it is a directly mounted style without using brackets, its overall length is shorter, and its installation pitch can be made smaller. Thus, the space that is required for installation has been dramatically reduced.

Improved installation accuracy and strength

A centering boss has been provided to improve the installation accuracy. Also, because it is the directly mounted style, the strength has been increased.

Two styles of installation

Two styles of installations are available and can be selected according to the purpose: the front mounting style or the bottom mounting style.

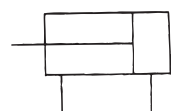


Bottom mounting style

Front mounting style

JIS Symbol

Double acting



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB7 | Cold resistant cylinder |
| -XB9 | Low speed cylinder (10 to 50 mm/s) |
| -XB13 | Low speed cylinder (5 to 50 mm/s) |
| -XC3 | Special port location |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC8 | Adjustable stroke cylinder/Adjustable extension type |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC11 | Dual stroke cylinder/Single rod type |
| -XC13 | Auto switch mounting rail style |
| -XC20 | Head cover axial port |
| -XC22 | Fluoro rubber seals |
| -XC25 | No fixed orifice of connecting port |
| -XC29 | Double knuckle joint with spring pin |

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.05 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $+1.4$ 0 mm | | | |
| Piston speed | 50 to 750 mm/s | | | |
| Cushion | Rubber bumper | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ⁽¹⁾ | Maximum manufacturable stroke (mm) ⁽²⁾ |
|----------------|--|---|
| 20 | 25, 50, 75, 100, 125, 150 | 1000 |
| 25 | 25, 50, 75, 100, 125, 150, 200 | 1500 |
| 32 | 25, 50, 75, 100, 125, 150, 200 | 2000 |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300 | 2000 |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) Please contact SMC for longer strokes.

Minimum Stroke for Auto Switch Mounting

Refer to page 6-4-5 for the minimum stroke for auto switch mounting, since it is the same as standard type, double acting, single rod type.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series CM2R**

Accessory

| Accessory | Standard equipment | Option | |
|-----------------------|--------------------|----------------------|-----------------------------------|
| Mounting | Rod end nut | Single knuckle joint | Double knuckle joint (With pin) * |
| Bottom mounting style | ● | ● | ● |
| Front mounting style | ● | ● | ● |

* Knuckle pin and snap ring (cotter pin for ø40) are shipped together.

Weight

| Bore size (mm) | | (kg) | | | |
|--|-----------------------|------|------|------|------|
| | | 20 | 25 | 32 | 40 |
| Basic weight | Bottom mounting style | 0.14 | 0.23 | 0.32 | 0.62 |
| | Front mounting style | 0.14 | 0.22 | 0.32 | 0.61 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |

Calculation: (Example) CM2RA32-100

(ø32, 100 stroke, Bottom mounting)

- Basic weight.....0.32 kg
- Additional weight.....0.08 kg
- Cylinder stroke.....100 mm

$$0.32 + 0.08 \times 100/50 = 0.48 \text{ kg}$$

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

⚠ Warning

- Do not rotate the cover.**
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.
- Do not operate with the cushion needle in a fully closed condition.**
Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".
- Do not open the cushion needle wide excessively.**
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.
- In the case of exceeding the standard stroke length, implement an intermediate support.**
When using cylinder with longer stroke, implement an intermediate support for preventing the joint of rod cover and cylinder tube from being broken by vibration or external load.

⚠ Caution

- Not able to disassemble.**
Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.
- Use caution to the popping of a snap ring.**
When replacing rod seals and removing and mounting a snap ring, use a proper tool (snap ring plier: tool for installing a type C snap ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier. Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.
- Do not touch the cylinder during operation.**
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.
- Do not use an air cylinder as an air-hydro cylinder.**
If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

Clean Series

10-CM2R **Mounting style** **Bore size** **Stroke**

• Clean Series (with relief port)

The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

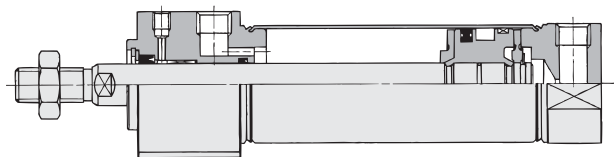


Specifications

| | |
|-------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper (Standard equipment) |
| Relief port size | M5 x 0.8 |
| Piston speed | 30 to 400 mm/s |
| Mounting | Bottom mounting style, Front mounting style |

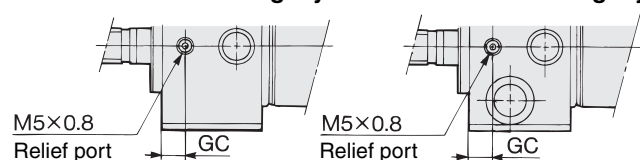
* Auto switch can be mounted.

Construction



Front mounting style

Bottom mounting style



| Bore size (mm) | GC |
|----------------|----|
| 20 | 6 |
| 25 | 6 |
| 32 | 7 |
| 40 | 9 |

For details, refer to the separate catalog, "Pneumatic Clean Series".

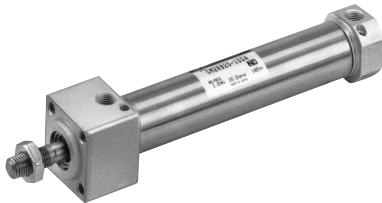
Series CM2R

With Air Cushion

CM2R **Mounting style** **Bore size** **Stroke** **A**

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.



Specifications

| | |
|-------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Piping | Screw-in type |
| Piston speed | 50 to 1000 mm/s |
| Mounting | Bottom mounting style Rod mounting style |

* Auto switch can be mounted.

| Bore size (mm) | Effective cushion length (mm) | Kinetic energy absorbable (J) |
|----------------|-------------------------------|-------------------------------|
| 20 | 11.0 | 0.54 |
| 25 | 11.0 | 0.78 |
| 32 | 11.0 | 1.27 |
| 40 | 11.8 | 2.35 |

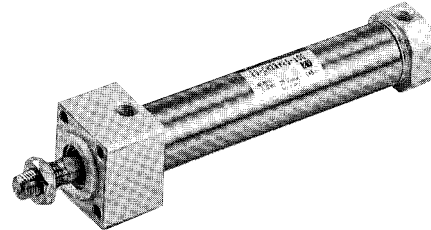
- For construction, refer to page 6-4-73.
- Dimensions: Refer to pages 6-4-74 to 6-4-75.
- For other specifications, refer to page 6-4-70.

Copper-free

20-CM2R **Mounting style** **Bore size** **Stroke**

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.



Specifications

| | |
|-------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper |
| Piston speed | 50 to 750 mm/s |
| Mounting | Bottom mounting style Front mounting style |

* Auto switch can be mounted.

Air-hydro

CM2HR **Mounting style** **Bore size** **Stroke**

Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.

Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.



Specifications

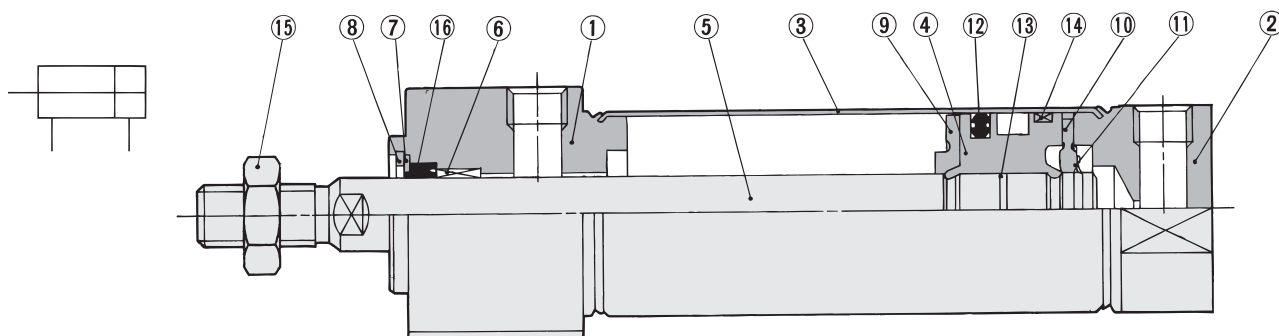
| | |
|-------------------------------|---|
| Type | Air-hydro |
| Fluid | Turbine oil |
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Proof pressure | 1.5 MPa |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.18 MPa |
| Piston speed | 15 to 300 mm/s |
| Cushion | Rubber bumper |
| Ambient and fluid temperature | 5 to 60°C |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | ± 1.4 mm |
| Mounting | Bottom mounting style, Front mounting style |

* Auto switch can be mounted. Dimensions are the same as standard type.

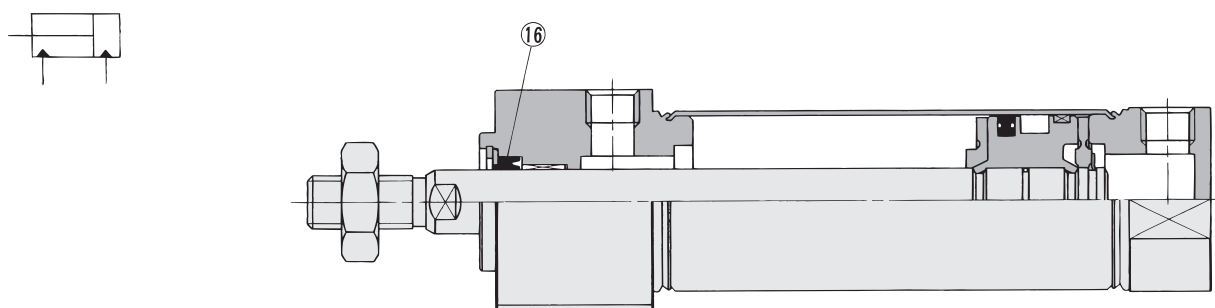
- For construction, refer to page 6-4-73.
- Since the dimensions of mounting style is the same as pages 6-4-74 to 6-4-75, refer to those pages.

Construction

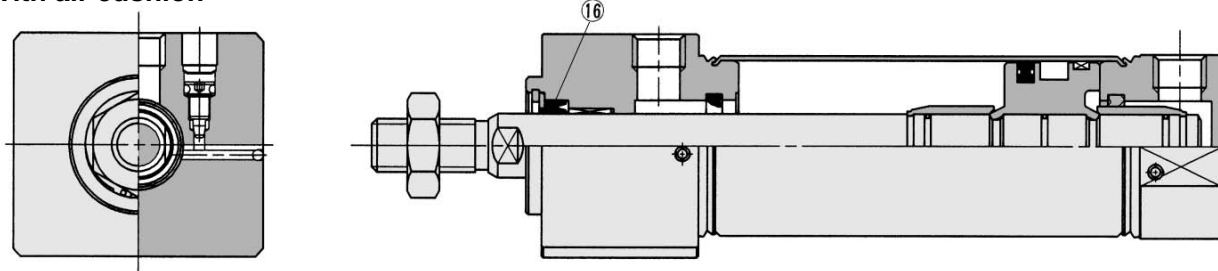
Rubber bumper



Air-hydro



With air cushion



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Carbon steel | Hard chrome plated |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Bumper A | Urethane | |
| ⑩ | Bumper B | Urethane | |
| ⑪ | Snap ring | Stainless steel | |
| ⑫ | Piston seal | NBR | |
| ⑬ | Piston gasket | NBR | |
| ⑭ | Wear ring | Resin | |
| ⑮ | Rod end nut | Carbon steel | Nickel plated |

For proper auto switch mounting position (at stroke end), refer to page 6-4-23 to 6-4-24, since the operating range is the same as standard type, single rod.

Replacement Parts: With Rubber Bumper, With Air Cushion

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ⑮ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |

Air-hydro

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|--------|---------|--------|
| | | | 20 | 25 | 32 | 40 |
| ⑮ | Rod seal | NBR | HDU-8 | HDU-10 | HDU-12L | HDU-14 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

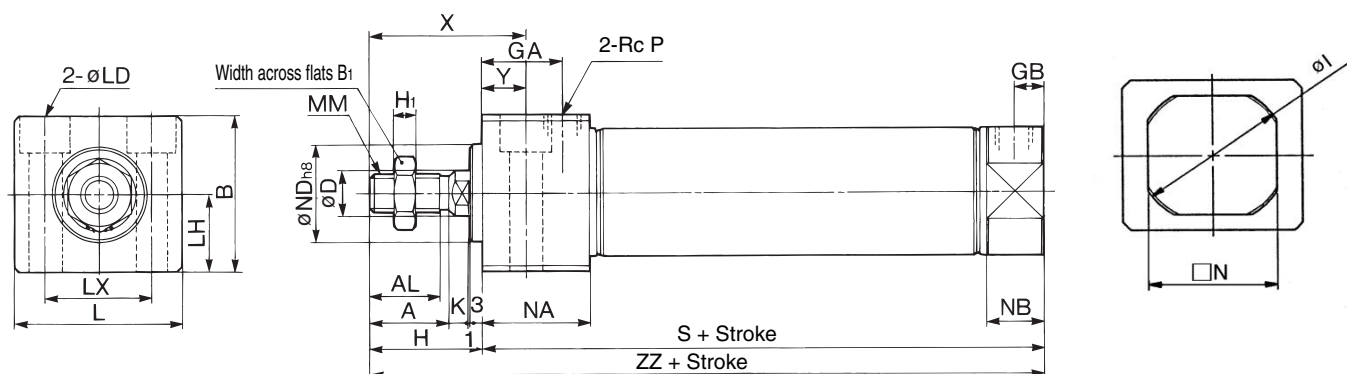
20-

Data

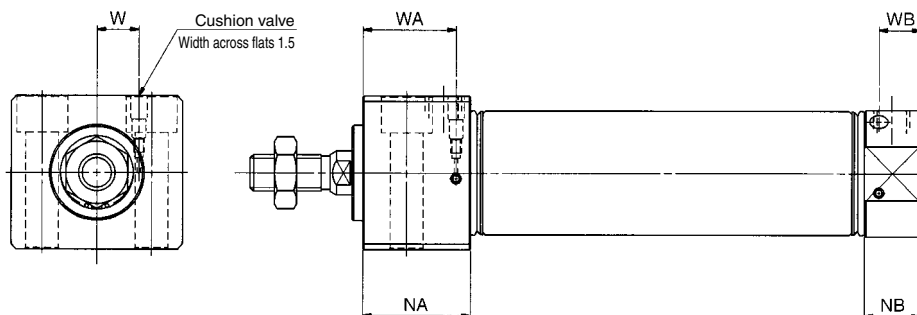
Series CM2R

Bottom Mounting Style

CM2RA Bore size — Stroke



With air cushion



| Bore size (mm) | Stroke range |
|----------------|--------------|
| 20 | 1 to 150 |
| 25 | 1 to 200 |
| 32 | 1 to 200 |
| 40 | 1 to 300 |

| Bore size (mm) | A | AL | B | B ₁ | D | GA | GB | H | H ₁ | I | K | L | LD | LH | LX | MM | N | NA | NB | ND | P | S | X | Y | ZZ |
|----------------|----|------|------|----------------|----|----|----|----|----------------|------|-----|------|-----------------------------------|----|----|------------|------|------|------|-----------------------------------|-----|-----|----|----|-----|
| 20 | 18 | 15.5 | 30.3 | 13 | 8 | 22 | 8 | 27 | 5 | 28 | 5 | 33.5 | ø5.5, ø9.5 counterbore depth 6.5 | 15 | 21 | M8 x 1.25 | 24 | 29 | 15 | 20 ⁰ _{-0.033} | 1/8 | 76 | 39 | 12 | 103 |
| 25 | 22 | 19.5 | 36.3 | 17 | 10 | 22 | 8 | 31 | 6 | 33.5 | 5.5 | 39 | ø6.6, ø11 counterbore depth 7.5 | 18 | 25 | M10 x 1.25 | 30 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 76 | 43 | 12 | 107 |
| 32 | 22 | 19.5 | 42.3 | 17 | 12 | 22 | 8 | 31 | 6 | 37.5 | 5.5 | 47 | ø9, ø14 counterbore depth 10 | 21 | 30 | M10 x 1.25 | 34.5 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 78 | 43 | 12 | 109 |
| 40 | 24 | 21 | 52.3 | 22 | 14 | 27 | 11 | 34 | 8 | 46.5 | 7 | 58.5 | ø11, ø17.5 counterbore depth 12.5 | 26 | 38 | M14 x 1.5 | 42.5 | 37.5 | 21.5 | 32 ⁰ _{-0.039} | 1/4 | 104 | 49 | 15 | 138 |

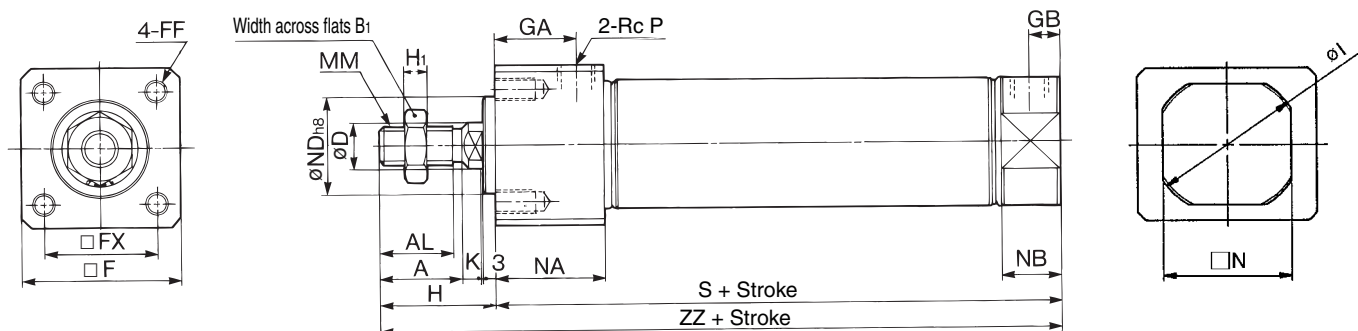
With Air Cushion

| Bore size (mm) | NA | NB | WA | WB | W |
|----------------|------|------|----|----|------|
| 20 | 31.5 | 17.5 | 27 | 13 | 8.5 |
| 25 | 31.5 | 17.5 | 27 | 13 | 10.5 |
| 32 | 31.5 | 17.5 | 27 | 13 | 11.5 |
| 40 | 37.5 | 21.5 | 32 | 16 | 15 |

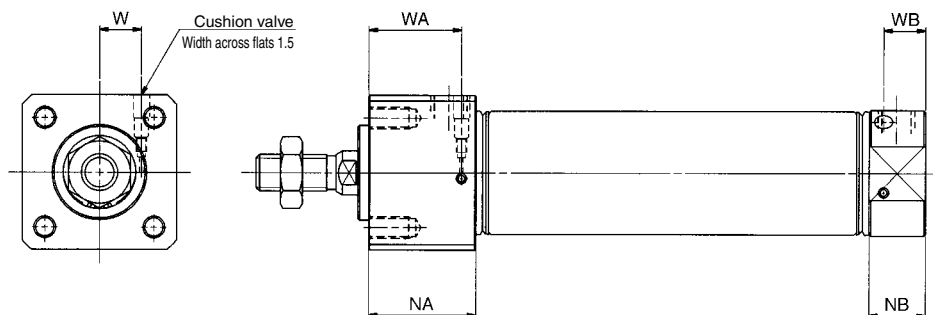
Air Cylinder: Direct Mount Type Double Acting, Single Rod **Series CM2R**

Front Mounting Style

CM2RB Bore size — Stroke



With air cushion



| Bore size (mm) | Stroke range |
|----------------|--------------|
| 20 | 1 to 150 |
| 25 | 1 to 200 |
| 32 | 1 to 200 |
| 40 | 1 to 300 |

| Bore size (mm) | A | AL | B ₁ | D | F | FF | FX | GA | GB | H | H ₁ | I | K | MM | N | NA | NB | ND | P | S | ZZ |
|----------------|----|------|----------------|----|------|--------------------|----|----|----|----|----------------|------|-----|------------|------|------|------|-----------------------------------|-----|-----|-----|
| 20 | 18 | 15.5 | 13 | 8 | 30.4 | M5 x 0.8 depth 9 | 22 | 22 | 8 | 27 | 5 | 28 | 5 | M8 x 1.25 | 24 | 29 | 15 | 20 ⁰ _{-0.033} | 1/8 | 76 | 103 |
| 25 | 22 | 19.5 | 17 | 10 | 36.4 | M6 x 1 depth 11 | 26 | 22 | 8 | 31 | 6 | 33.5 | 5.5 | M10 x 1.25 | 30 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 76 | 107 |
| 32 | 22 | 19.5 | 17 | 12 | 42.4 | M6 x 1 depth 11 | 30 | 22 | 8 | 31 | 6 | 37.5 | 5.5 | M10 x 1.25 | 34.5 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 78 | 109 |
| 40 | 24 | 21 | 22 | 14 | 52.4 | M8 x 1.25 depth 14 | 36 | 27 | 11 | 34 | 8 | 46.5 | 7 | M14 x 1.5 | 42.5 | 37.5 | 21.5 | 32 ⁰ _{-0.039} | 1/4 | 104 | 138 |

With Air Cushion

| Bore size (mm) | NA | NB | WA | WB | W |
|----------------|------|------|----|----|------|
| 20 | 31.5 | 17.5 | 27 | 13 | 8.5 |
| 25 | 31.5 | 17.5 | 27 | 13 | 10.5 |
| 32 | 31.5 | 17.5 | 27 | 13 | 11.5 |
| 40 | 37.5 | 21.5 | 32 | 16 | 15 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Air Cylinder: Direct Mount, Non-rotating Rod Type Double Acting, Single Rod

Series *CM2RK*

ø20, ø25, ø32, ø40



How to Order



Without auto switch

CM2RK **A** **20** — **100**

With auto switch

CDM2RK **A** **20** — **100** — **H7BW**

Built-in magnet

Mounting style

| | |
|----------|-----------------------|
| A | Bottom mounting style |
| B | Front mounting style |

Bore size

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 6-4-77.)

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | | |
|--|---|------------------|-----------------|-------------------------|--------------|-----------|-------------------|-----------------------|-------|-------|------------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC |
| | | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | |
| | | | | | | | — | C73C | ● | ● | ● | ● | — | | |
| | | | | | | | — | A33A | — | — | — | ● | — | | |
| | 100 V, 200 V | A34A | | | | — | — | — | ● | — | | | | | |
| | DIN terminal | A44A | | | | — | — | — | ● | — | Relay, PLC | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | — | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | 12 V | | H7A2 | | ● | ● | ○ | — | ○ | | | |
| | | Connector | | 2-wire | | 12 V | | H7B | ● | ● | ○ | — | ○ | | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | | H7C | ● | ● | ● | ● | — | | |
| | | Terminal conduit | | 2-wire | | 12 V | | G39A | — | — | — | ● | — | IC circuit | |
| | 2-wire | | | 12 V | | K39A | | — | — | — | ● | — | — | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | 5 V, 12 V | | H7PW | ● | ● | ○ | — | ○ | | |
| | Water resistant (2-color indication) | | | 2-wire | | 12 V | | H7BW | ● | ● | ○ | — | ○ | — | |
| | | | | | | H7BA | | — | ● | ○ | — | ○ | | | |
| | | | | | | H7NF | | ● | ● | ○ | — | ○ | IC circuit | | |
| | With diagnostic output (2-color indication) | | | 3-wire (NPN) | | 5 V, 12 V | | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Direct Mount, Non-rotating Rod Type Double Acting, Single Rod **Series CM2RK**

Series CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

Non-rotating accuracy

A type of cylinder in which the rod does not rotate because of its hexagonal shape. Cylinder

ø20, ø25—±0.7°

ø32, ø40—±0.5°

Space-saving configuration

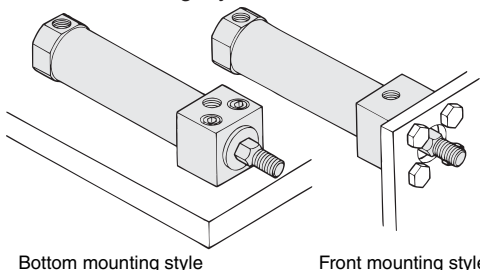
Because it is a directly mounted style without using brackets, its overall length is shorter, and its installation pitch can be made smaller. Thus, the space that is required for installation has been dramatically reduced.

Improved installation accuracy and strength

A centering boss has been provided to improve the installation accuracy. Also, because it is the directly mounted style, the strength has been increased.

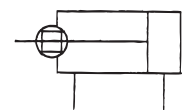
Two styles of installation

Two styles of installations are available and can be selected according to the purpose: the front mounting style or the bottom mounting style.



JIS Symbol

Double acting



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|---|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XC3 | Special port location |
| -XC5 | Heat resistant cylinder (110°C) |
| -XC6 | Piston rod and rod end nut made of stainless steel |
| -XC8 | Adjustable stroke cylinder/Adjustable extension type |
| -XC9 | Adjustable stroke cylinder/Adjustable retraction type |
| -XC11 | Dual stroke cylinder/Single rod type |
| -XC13 | Auto switch mounting rail style |
| -XC20 | Head cover axial port |
| -XC22 | Fluoro rubber seals |
| -XC29 | Double knuckle joint with spring pin |

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|-------|--------|-------|
| Rod non-rotating accuracy | ±0.7° | | ±0.5° | |
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.05 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $\begin{smallmatrix} +1.4 \\ 0 \end{smallmatrix}$ mm | | | |
| Piston speed | 50 to 500 mm/s | | | |
| Cushion | Rubber bumper | | | |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) ⁽¹⁾ |
|----------------|--|
| 20 | 25, 50, 75, 100, 125, 150 |
| 25 | 25, 50, 75, 100, 125, 150, 200 |
| 32 | 25, 50, 75, 100, 125, 150, 200 |
| 40 | 25, 50, 75, 100, 125, 150, 200, 250, 300 |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) The maximum limit is 1000 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-4-5, since it is the same as standard type.

Proper Auto Switch Mounting Position and Operating Range

For proper auto switch mounting position (at stroke end), refer to page 6-4-23 to 6-4-24, since the operating range is the same as standard type, single rod.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2RK

Copper-free

20-CM2RK Mounting style Bore size — Stroke

• Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.



Specifications

| | |
|-------------------------|---|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Max. operating pressure | 1.0 MPa |
| Min. operating pressure | 0.05 MPa |
| Cushion | Rubber bumper |
| Piston speed | 50 to 500 mm/s |
| Mounting | Bottom mounting style, Front mounting style |

* Auto switch can be mounted.

Accessory

| Accessory | Standard equipment | Option | |
|-----------------------|--------------------|----------------------|-----------------------------------|
| Mounting | Rod end nut | Single knuckle joint | Double knuckle joint (With pin) * |
| Bottom mounting style | ● | ● | ● |
| Front mounting style | ● | ● | ● |

* Knuckle pin and snap ring (cotter pin for bore size ø40) are shipped together.

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|-----------------------|------|------|------|------|
| Basic weight | Bottom mounting style | 0.14 | 0.23 | 0.32 | 0.63 |
| | Front mounting style | 0.14 | 0.22 | 0.32 | 0.62 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.07 | 0.09 | 0.14 |

Calculation: (Example) CM2RKA32-100 (ø32, 100 stroke, Bottom mounting)

- Basic weight.....0.32 kg
- Additional weight.....0.09 kg
- Cylinder stroke.....100 mm

$$0.32 + 0.09 \times 100/50 = 0.50 \text{ kg}$$

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Caution on Handling/Disassembly

⚠ Warning

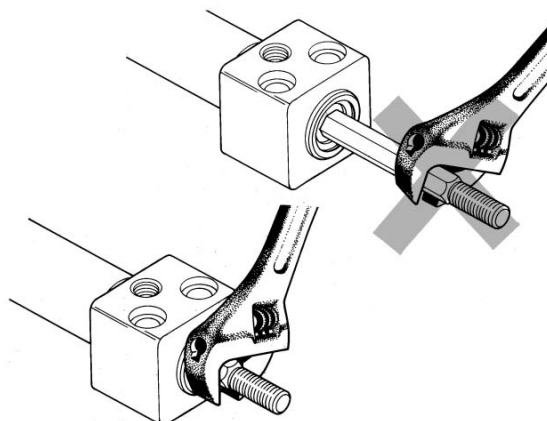
- Do not rotate the cover.**
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.
- Do not operate with the cushion needle in a fully closed condition.**
Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the "Hexagon wrench key: nominal size 1.5".
- Do not open the cushion needle wide excessively.**
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.
- In the case of exceeding the standard stroke length, implement an intermediate support.**
When using cylinder with longer stroke, implement an intermediate support for preventing the joint of rod cover and cylinder tube from being broken by vibration or external load.

⚠ Caution

- Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.**
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy. Refer to the table below for the approximate values of the allowable range of rotational torque.

| Allowable rotational torque (N-m or less) | ø20 | ø25 | ø32 | ø40 |
|---|-----|------|------|------|
| | 0.2 | 0.25 | 0.25 | 0.44 |

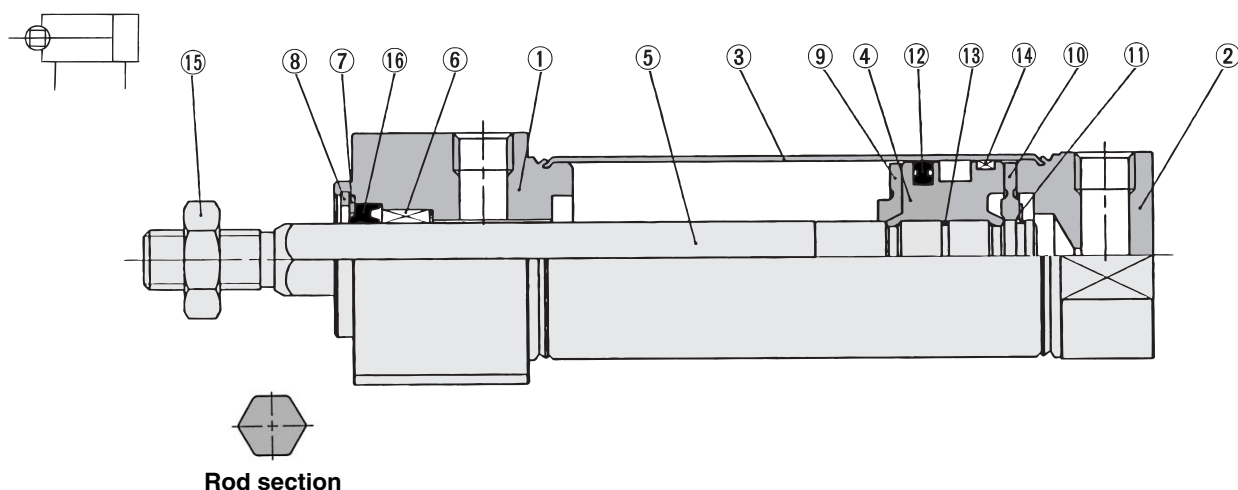
To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



- When replacing rod seals, please contact SMC.**
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.
- Not able to disassemble.**
Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.
- Do not touch the cylinder during operation.**
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

Air Cylinder: Direct Mount, Non-rotating Rod Type Double Acting, Single Rod **Series CM2RK**

Construction



Component Parts

| No. | Description | Material | Note |
|-----|--------------------|--------------------------------|----------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Stainless steel | |
| ⑥ | Non-rotating guide | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Bumper A | Urethane | |
| ⑩ | Bumper B | Urethane | |
| ⑪ | Snap ring | Stainless steel | |
| ⑫ | Piston seal | NBR | |
| ⑬ | Piston gasket | NBR | |
| ⑭ | Wear ring | Resin | |
| ⑮ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|---------|---------|
| | | | 20 | 25 | 32 | 40 |
| ⑮ | Rod seal | NBR | PDR-8W | PDR-10W | PDR-12W | PDR-14W |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

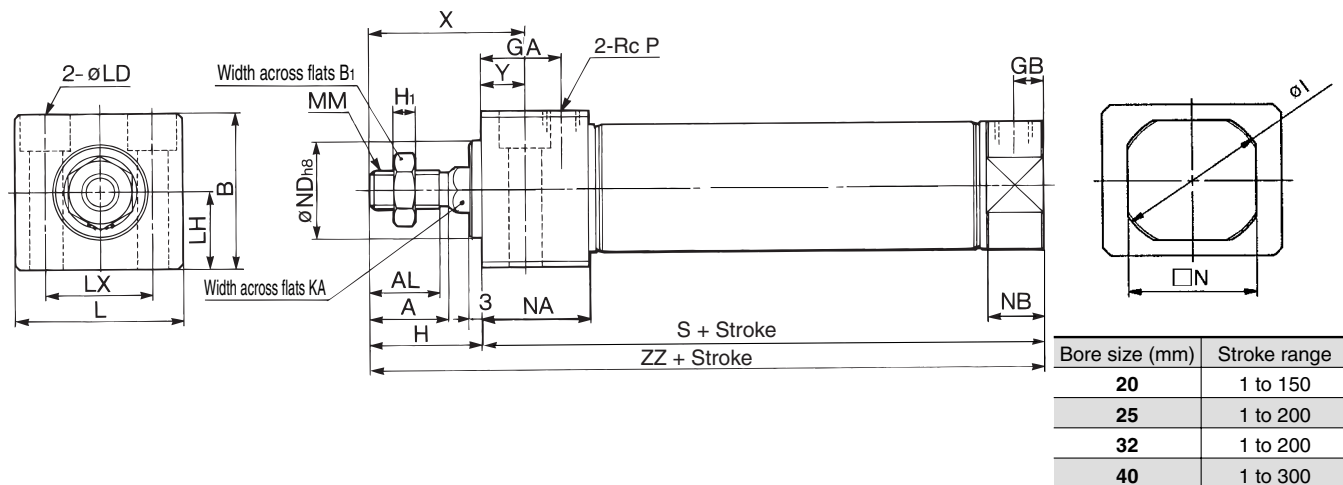
20-

Data

Series CM2RK

Bottom Mounting Style

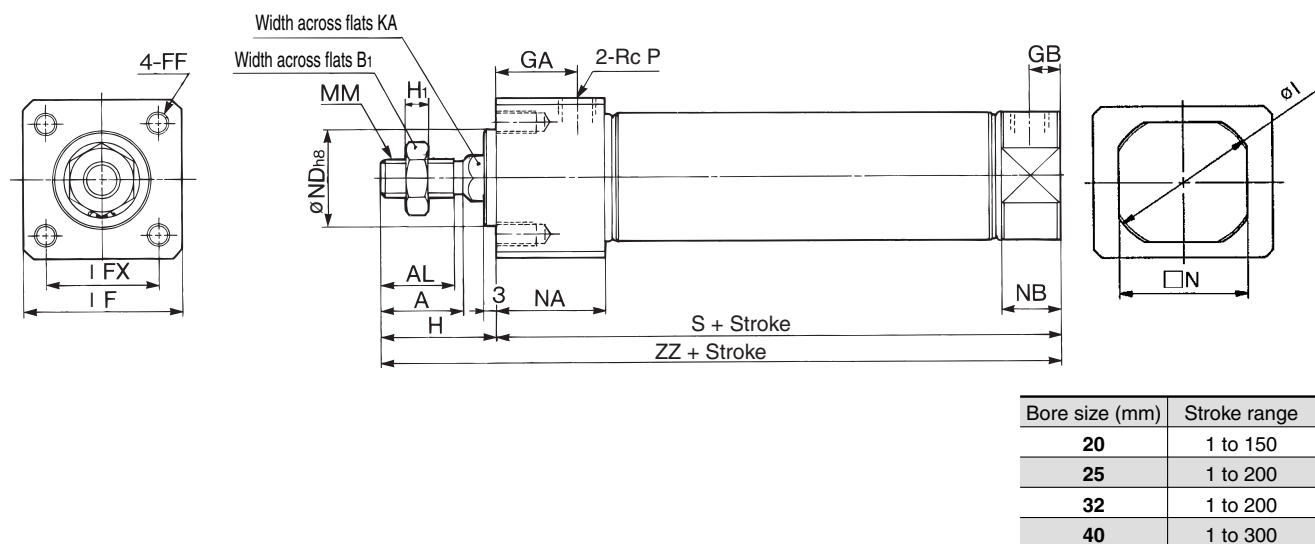
CM2RKA Bore size — Stroke



| Bore size (mm) | A | AL | B | B ₁ | GA | GB | H | H ₁ | I | KA | L | LD | LH | LX | MM | N | NA | NB | ND | P | S | X | Y | ZZ |
|----------------|----|------|------|----------------|----|----|----|----------------|------|------|------|-----------------------------------|----|----|------------|------|------|------|-----------------------------------|-----|-----|----|----|-----|
| 20 | 18 | 15.5 | 30.3 | 13 | 22 | 8 | 27 | 5 | 28 | 8.2 | 33.5 | ø5.5, ø9.5 counterbore depth 6.5 | 15 | 21 | M8 x 1.25 | 24 | 29 | 15 | 20 ⁰ _{-0.033} | 1/8 | 76 | 39 | 12 | 103 |
| 25 | 22 | 19.5 | 36.3 | 17 | 22 | 8 | 31 | 6 | 33.5 | 10.2 | 39 | ø6.6, ø11 counterbore depth 7.5 | 18 | 25 | M10 x 1.25 | 30 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 76 | 43 | 12 | 107 |
| 32 | 22 | 19.5 | 42.3 | 17 | 22 | 8 | 31 | 6 | 37.5 | 12.2 | 47 | ø9, ø14 counterbore depth 10 | 21 | 30 | M10 x 1.25 | 34.5 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 78 | 43 | 12 | 109 |
| 40 | 24 | 21 | 52.3 | 22 | 27 | 11 | 34 | 8 | 46.5 | 14.2 | 58.5 | ø11, ø17.5 counterbore depth 12.5 | 26 | 38 | M14 x 1.5 | 42.5 | 37.5 | 21.5 | 32 ⁰ _{-0.039} | 1/4 | 104 | 49 | 15 | 138 |

Front Mounting Style

CM2RKB Bore size — Stroke



| Bore size (mm) | A | AL | B ₁ | F | FF | FX | GA | GB | H | H ₁ | I | KA | MM | N | NA | NB | ND | P | S | ZZ |
|----------------|----|------|----------------|------|--------------------|----|----|----|----|----------------|------|------|------------|------|------|------|-----------------------------------|-----|-----|-----|
| 20 | 18 | 15.5 | 13 | 30.4 | M5 x 0.8 depth 9 | 22 | 22 | 8 | 27 | 5 | 28 | 8.2 | M8 x 1.25 | 24 | 29 | 15 | 20 ⁰ _{-0.033} | 1/8 | 76 | 103 |
| 25 | 22 | 19.5 | 17 | 36.4 | M6 x 1 depth 11 | 26 | 22 | 8 | 31 | 6 | 33.5 | 10.2 | M10 x 1.25 | 30 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 76 | 107 |
| 32 | 22 | 19.5 | 17 | 42.4 | M6 x 1 depth 11 | 30 | 22 | 8 | 31 | 6 | 37.5 | 12.2 | M10 x 1.25 | 34.5 | 29 | 15 | 26 ⁰ _{-0.033} | 1/8 | 78 | 109 |
| 40 | 24 | 21 | 22 | 52.4 | M8 x 1.25 depth 14 | 36 | 27 | 11 | 34 | 8 | 46.5 | 14.2 | M14 x 1.5 | 42.5 | 37.5 | 21.5 | 32 ⁰ _{-0.039} | 1/4 | 104 | 138 |

Air Cylinder: Low Friction Type Double Acting, Single Rod

Series *CM2Q*

ø20, ø25, ø32, ø40

How to Order

Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-82.)

Direction of low friction

| | |
|----------|----------------------------|
| F | With pressure at head side |
| B | With pressure at rod side |

Without auto switch
CM2Q **L** **40** — **150** **F**

With auto switch
CDM2Q **L** **40** — **150** **F** — **H7BW**

Built-in magnet

Bore size

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|------|-------------------|------------------------|-------|-------|----------|--------------------|-----------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | C76 | ● | ● | — | — | — | IC circuit | — |
| | | Connector | | 2-wire | 24 V | 12 V | C73 | ● | ● | ● | — | — | — | Relay, PLC |
| | | Terminal conduit | | | | | B54 | ● | ● | ● | — | — | | |
| | | DIN terminal | | | | | C73C | ● | ● | ● | ● | — | | |
| | Diagnostic indication (2-color indication) | Grommet | | | | | A33A | — | — | — | ● | — | — | Relay, PLC |
| | | Terminal conduit | | | | | A34A | — | — | — | ● | — | | |
| | | DIN terminal | | | | | A44A | — | — | — | ● | — | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 12 V | H7A1 | ● | ● | ○ | — | ○ | IC circuit | — |
| | | Connector | | 3-wire (PNP) | | | H7A2 | ● | ● | ○ | — | ○ | IC circuit | |
| | | Terminal conduit | | 2-wire | | | H7B | ● | ● | ○ | — | ○ | — | |
| | | DIN terminal | | 3-wire (NPN) | | | H7C | ● | ● | ● | ● | — | — | |
| | | Grommet | | 2-wire | | | G39A | — | — | — | ● | — | IC circuit | |
| | | Terminal conduit | | 3-wire (PNP) | | | K39A | — | — | — | ● | — | — | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | | H7NW | ● | ● | ○ | — | ○ | IC circuit | — |
| | | Terminal conduit | | 3-wire (PNP) | | | H7PW | ● | ● | ○ | — | ○ | IC circuit | |
| | | DIN terminal | | 2-wire | | | H7BW | ● | ● | ○ | — | ○ | — | |
| | Water resistant (2-color indication) | Grommet | Yes | 2-wire | 24 V | 12 V | H7BA | — | ● | ○ | — | ○ | — | — |
| | | Terminal conduit | | 3-wire (NPN) | | | H7NF | ● | ● | ○ | — | ○ | IC circuit | |
| | With diagnostic output (2-color indication) | Grommet | Yes | 3-wire (NPN) | 24 V | 12 V | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2Q

Designed with a low sliding resistance of the piston, this air cylinder is ideal for applications such as contact pressure control, which requires smooth movements at low pressures.

Low sliding resistance

Minimum operating pressure: 0.025 MPa

Stable sliding resistance

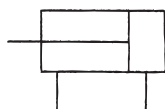
The sliding resistance remains stable even when the operating pressure changes.



Clevis integrated style

JIS Symbol

Double acting,
Single rod

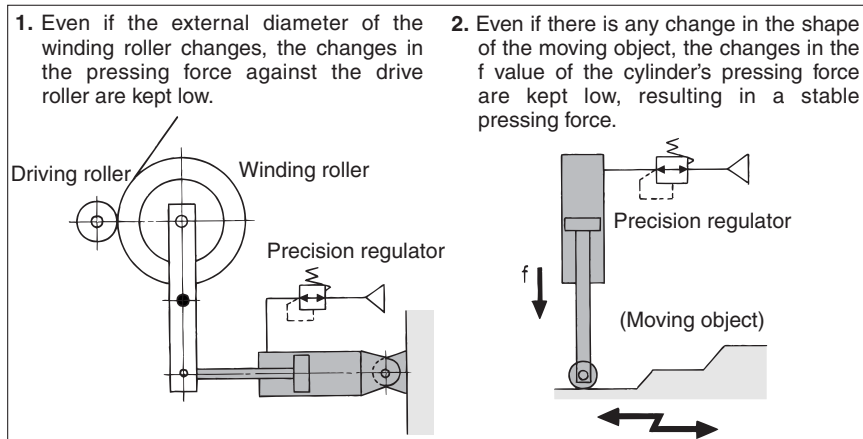


Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |
| -XC3 | Special port location |
| -XC18 | NPT finish piping port |

Application Example

Low friction cylinder is used in combination with precision regulator (Series IR).



Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|----|----|----|
| Action | Double acting, Single rod | | | |
| Direction of low friction | One direction * | | | |
| Fluid | Air | | | |
| Proof pressure | 1.05 MPa | | | |
| Maximum operating pressure | 0.7 MPa | | | |
| Minimum operating pressure | 0.025 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Allowable leakage | 0.5 #/min (ANR) or less | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $+1.4$ 0 mm | | | |
| Cushion | Rubber bumper | | | |

* Refer to "Selecting The Low Friction Direction".

Standard Stroke

| Bore size (mm) | Standard stroke (mm) | Maximum manufacturable stroke (mm) |
|----------------|--|------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150 200, 250, 300 | 1000 |
| 25 | | |
| 32 | | |
| 40 | | |



Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Note 3) The longer the stroke is, the greater the sliding resistance could become, due to the deflection of the piston rod. Therefore, consider installing a guide, etc. before using.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-4-5, since it is the same as standard type.

Mounting Style and Accessory

| Accessory | Standard equipment | | | Option | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis ⁽⁴⁾ bracket |
| Mounting | | | | | | |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — |
| Axial foot style | ● (2) | ● | — | ● | ● | — |
| Rod side flange style | ● (1) | ● | — | ● | ● | — |
| Head side flange style | ● (1) | ● | — | ● | ● | — |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — |
| Rod side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — |



Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.14 | 0.21 | 0.28 | 0.56 |
| | Axial foot style | 0.29 | 0.37 | 0.44 | 0.83 |
| | Flange style | 0.20 | 0.30 | 0.37 | 0.68 |
| | Clevis integrated style | 0.12 | 0.19 | 0.27 | 0.52 |
| | Single clevis style | 0.18 | 0.25 | 0.32 | 0.65 |
| | Double clevis style | 0.19 | 0.27 | 0.33 | 0.69 |
| | Trunnion style | 0.18 | 0.28 | 0.34 | 0.66 |
| | Boss-cut basic style | 0.13 | 0.19 | 0.26 | 0.53 |
| | Boss-cut flange style | 0.19 | 0.28 | 0.35 | 0.65 |
| | Boss-cut trunnion style | 0.17 | 0.26 | 0.32 | 0.63 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |
| Option bracket | Clevis bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2QL32-100
 • Basic weight.....0.44 (Foot style, ø32)
 • Additional weight.....0.08/50 stroke
 • Cylinder stroke.....100 stroke
 0.44 + 0.08 x 100/50 = 0.60 kg

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis (With pin) ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |

* Two foot brackets and a mounting nut are attached.

Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size 40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|----------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Series CM2Q

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type)

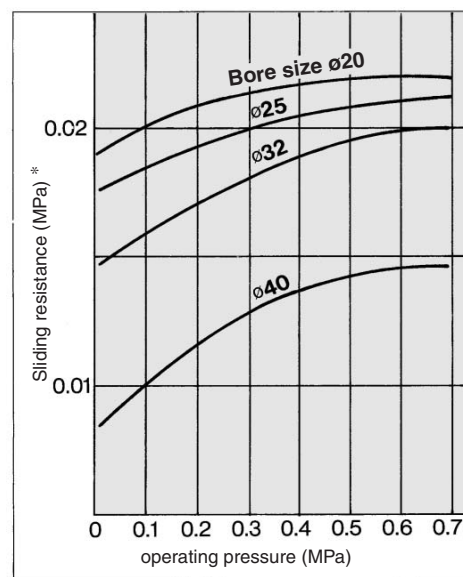
| ø20 | ø25 | ø32 | ø40 |
|-----|-----|-----|-----|
| ▲13 | ▲13 | ▲13 | ▲16 |

(mm)

Mounting style

- Boss-cut basic style (BZ)
- Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

Sliding Resistance of the Low Friction Side



* Conversion into the cylinder operating pressure:
1 MPa = 10.1972 kgf/cm²

Selecting the Low Friction Direction

To use the air cylinder as a balancer, etc., pressurize it only from one of the ports as shown in the application example, and keep the other port open to the atmosphere.

To operate by applying pressure from the rod cover port:

Low friction direction B (Application example 1)

To operate by applying pressure from the head cover port:

Low friction direction F (Application example 2)

In either case, if the piston rod is moved by an external force, it will operate with low friction for both in the extending and retracting directions.

⚠ Precautions

Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

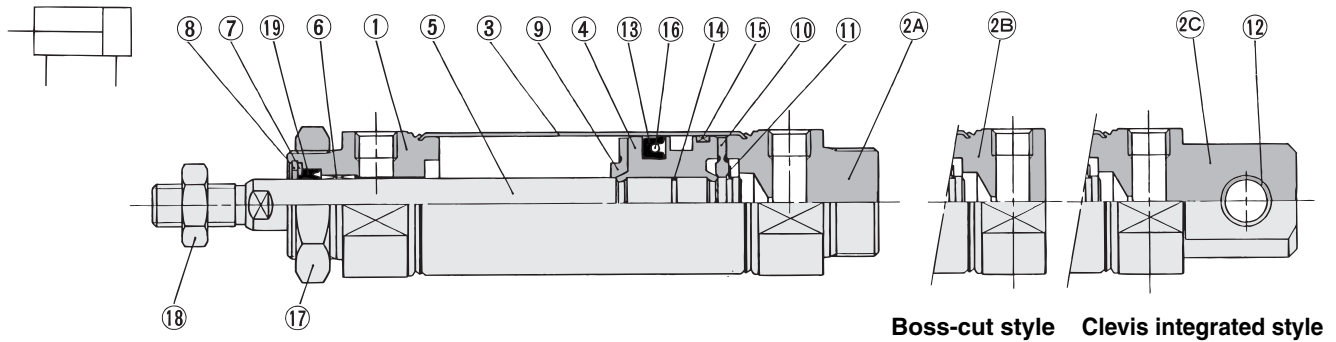
Operating Precautions

⚠ Warning

1. In the direction of low friction operation, speed control must be effected through the meter-in system. With meter-out control, the exhaust pressure will increase and create a greater sliding resistance.

Air Cylinder: Low Friction Type Double Acting, Single Rod **Series CM2Q**

Construction



Component Parts

| No. | Description | Material | Note |
|------|---------------|--------------------------------|--------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| (2A) | Head cover A | Aluminum alloy | Clear anodized * |
| (2B) | Head cover B | Aluminum alloy | Clear anodized ** |
| (2C) | Head cover B | Aluminum alloy | Clear anodized *** |
| ③ | Cylinder tube | Stainless steel | Chromated |
| ④ | Piston | Aluminum alloy | Hard chrome plated |
| ⑤ | Piston rod | Carbon steel | |
| ⑥ | Bushing | Oil impregnated sintered alloy | Nickel plated |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | |
| ⑨ | Bumper A | Urethane | |
| ⑩ | Bumper B | Urethane | |

* Basic style, ** Boss-cut style, *** Clevis integrated style

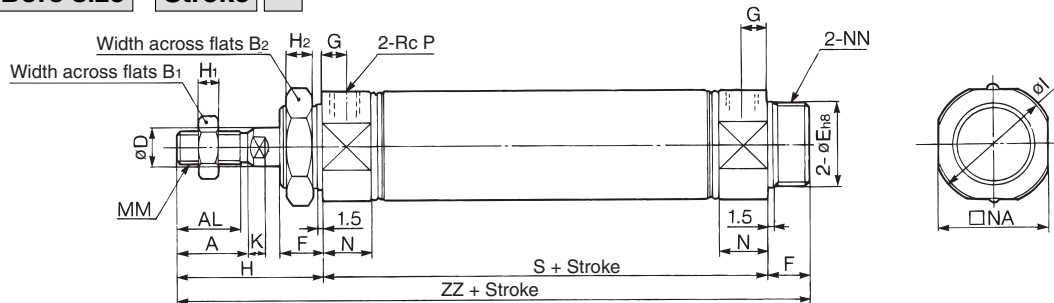
Basic Style (B)

| No. | Description | Material | Note |
|-----|----------------|--------------------------------|---------------|
| ⑪ | Snap ring | Stainless steel | |
| ⑫ | Clevis bushing | Oil-impregnated sintered alloy | |
| ⑬ | Piston seal | NBR | |
| ⑭ | Piston gasket | NBR | |
| ⑮ | Wear ring | Resin | |
| ⑯ | Back up O-ring | NBR | |
| ⑰ | mounting nut | Carbon steel | Nickel plated |
| ⑱ | Rod end nut | Carbon steel | Nickel plated |

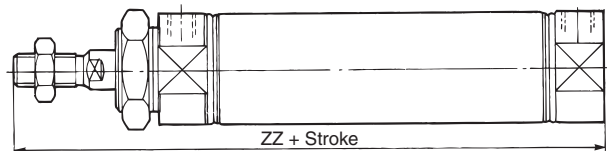
Replacement Parts

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|----------|
| | | | 20 | 25 | 32 | 40 |
| ⑱ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14LZ |

CM2QB **Bore size** **Stroke**



Boss-cut style



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | S | ZZ |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 65 | 119 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 65 | 123 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 67 | 125 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 91 | 157 |

Boss-cut Style

| Bore size (mm) | ZZ |
|----------------|-----|
| 20 | 106 |
| 25 | 110 |
| 32 | 112 |
| 40 | 141 |

Dimensions for Other Mounting Brackets

External dimensions of each mounting bracket other than basic style are obtained to add 3 mm respectively to S and ZZ dimension of the standard type, double acting, single rod listed in the dimensional table on pages 6-4-13 to 6-4-20.

Proper Auto Switch Mounting Position and Operating Range

For the proper auto switch mounting position (at stroke end), refer to page 6-4-23, since the operating range is the same as standard type, single rod. Add 3 mm to each "A" dimension of the standard type.

Air Cylinder: Centralized Piping Type Double Acting, Single Rod

Series **CM2□P**

ø20, ø25, ø32, ø40

How to Order

Mounting style

| | |
|---|-------------------------|
| B | Basic style |
| F | Rod side flange style |
| U | Rod side trunnion style |

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-87.)

Rod boot

| | |
|-----|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

Without auto switch CM2 **F** **32** **P** — **150** **J**

With auto switch **CDM2** **F** **32** **P** — **150** **J** — **H7BW** □

Built-in magnet

Centralized piping type

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|--------------|-------------------|------------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | | Relay, PLC |
| | | | | | | 100 V, 200 V | B54 | ● | ● | ● | ● | — | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | — | — | B59W | ● | ● | — | — | — | — | — | | | |
| | | Connector | | — | — | — | — | — | — | — | — | — | — | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | Connector | | 3-wire (PNP) | | 12 V | | H7A2 | ● | ● | ○ | — | ○ | — | | |
| | | | | Grommet | | 2-wire | | 5 V, 12 V | H7B | ● | ● | ○ | — | | | ○ |
| | | Connector | | | | 3-wire (NPN) | | 5 V, 12 V | H7C | ● | ● | ● | ● | — | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (PNP) | | 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | 2-wire | | 5 V, 12 V | | H7PW | ● | ● | ○ | — | ○ | — | | |
| | Water resistant (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7BW | ● | ● | ○ | — | ○ | | | — |
| | | | | | | Connector | | 5 V, 12 V | H7BA | — | ● | ○ | — | ○ | | |
| | With diagnostic output (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NF | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | | | Connector | | 5 V, 12 V | H7NF | ● | ● | ○ | — | ○ | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.

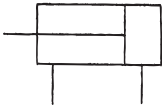
- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

Air Cylinder: Centralized Piping Type Double Acting, Single Rod **Series CM2□P**

A cylinder in which two piping ports are provided in the head cover, enabling pipes to be connected only in the axial direction.



JIS Symbol
Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XC4 | With heavy duty scraper |
| -XC6 | Piston rod and rod end nut made of stainless steel |

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for
Safety Instructions and Actuator
Precautions.

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|---|----------------|----------------|----------------|
| Action | Double acting, Single rod | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.05 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | $+1.4$ 0 mm | | | |
| Cushion | Rubber bumper | | | |
| Piston speed | 50 to 700 mm/s | 50 to 650 mm/s | 50 to 590 mm/s | 50 to 420 mm/s |
| Allowable kinetic energy | 0.27 J | 0.4 J | 0.65 J | 1.2 J |

Standard Stroke

| Bore size (mm) | Standard stroke ⁽¹⁾ (mm) | Maximum manufacturable stroke ⁽²⁾ (mm) |
|----------------|-------------------------------------|---|
| 20 | 25, 50, 75, 100, 125, 150 | 1000 |
| 25 | | |
| 32 | | |
| 40 | 200, 250, 300 | |

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Mounting Style and Accessory

| | Accessory | Standard equipment | | Option | | |
|-------------------------|-----------|--------------------|-------------|----------------------|---------------------------------|----------|
| | | Mounting nut | Rod end nut | Single knuckle joint | Double knuckle joint (With pin) | Rod boot |
| Mounting | | | | | | |
| Basic style | | ● (1 pc.) | ● | ● | ● | ● |
| Rod side style | | ● (1) | ● | ● | ● | ● |
| Flange side style | | | | | | |
| Rod side trunnion style | | ● (1) | ● | ● | ● | ● |

* Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----------|----------|----|
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|--------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |



Mounting screws set made of stainless steel

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7

• "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CM2□P

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|----------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C * |

* Maximum ambient temperature for the rod boot itself.

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------|------|------|------|------|
| Basic weight | Basic style | 0.14 | 0.21 | 0.27 | 0.58 |
| | Rod side flange style | 0.20 | 0.30 | 0.36 | 0.70 |
| | Rod side trunnion style | 0.18 | 0.28 | 0.33 | 0.68 |
| Additional weight per each 50 mm of stroke | | 0.05 | 0.08 | 0.10 | 0.17 |
| Option bracket | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle (with pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CM2F32P-100

- Basic weight.....0.36
- Additional weight.....0.10
- Cylinder stroke.....100 stroke
 $0.36 + 0.10 \times 100/50 = 0.56 \text{ kg}$

Copper-free

20-CM2 Mounting style Bore size P — Stroke

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.



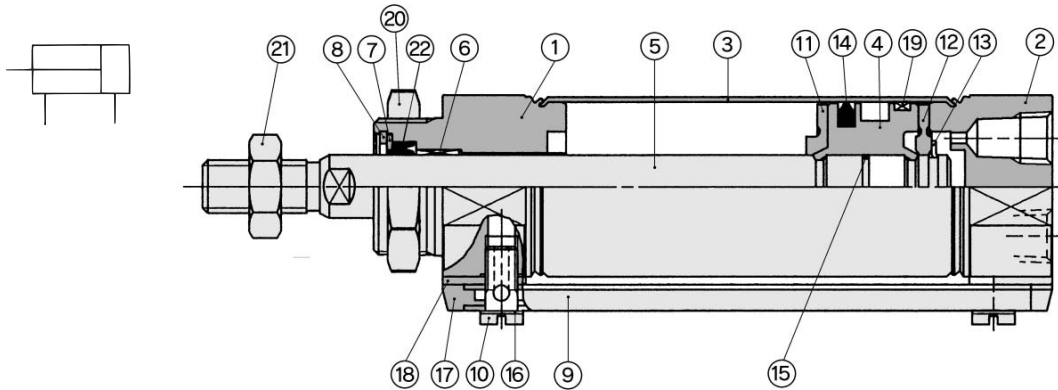
Specifications

| | | |
|-------------------------|---|----------------|
| Action | Double acting, Single rod | |
| Bore size (mm) | 20, 25, 32, 40 | |
| Max. operating pressure | 1.0 MPa | |
| Min. operating pressure | 0.05 MPa | |
| Piston speed | ø20 | 50 to 700 mm/s |
| | ø25 | 50 to 650 mm/s |
| | ø32 | 50 to 590 mm/s |
| | ø40 | 50 to 420 mm/s |
| Mounting | Basic style, Rod side flange style, Rod side trunnion style | |

* Auto switch can be mounted.

Air Cylinder: Centralized Piping Type Double Acting, Single Rod **Series CM2□P**

Construction



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|---------------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Carbon steel | Hard chrome plated |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Pipe | Aluminum alloy | Clear anodized |
| ⑩ | Stud | Brass | Electroless nickel plated |
| ⑪ | Bumper A | Urethane | |
| ⑫ | Bumper B | Urethane | |

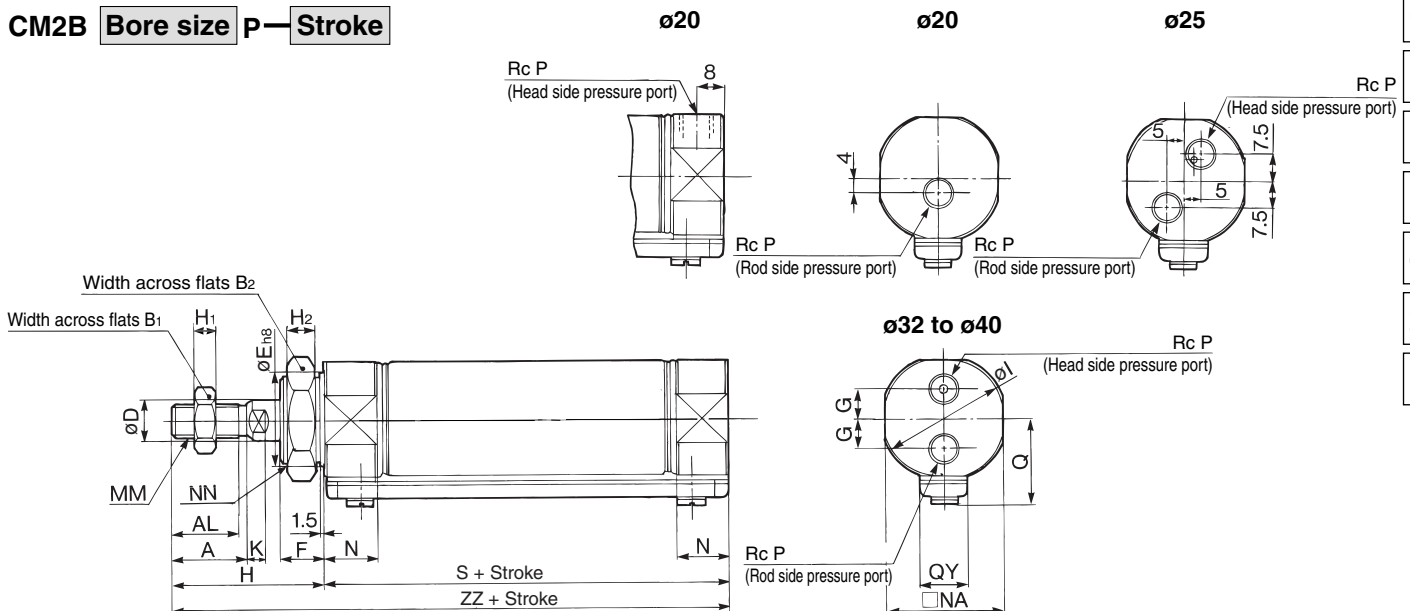
| No. | Description | Material | Note |
|-----|---------------|-----------------|---------------|
| ⑬ | Snap ring | Stainless steel | |
| ⑭ | Piston seal | NBR | |
| ⑮ | Piston gasket | NBR | |
| ⑯ | Gasket | Resin | |
| ⑰ | Pipe gasket | Urethane rubber | |
| ⑱ | Spacer gasket | Resin | Except ø25 |
| ⑲ | Wear ring | Resin | |
| ⑳ | mounting nut | Carbon steel | Nickel plated |
| ㉑ | Rod end nut | Carbon steel | Nickel plated |

Replacement Parts

| No. | Description | Material | Part no. | | | |
|-----|-------------|----------|----------|---------|----------|---------|
| | | | 20 | 25 | 32 | 40 |
| ㉒ | Rod seal | NBR | PDU-8Z | PDU-10Z | PDU-12LZ | PDU-14Z |

Basic Style (B)

CM2B Bore size P—Stroke



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | E | F | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | Q | QY | S | ZZ |
|----------------|----|------|----------------|----------------|----|-----------------------------------|----|------|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|------|----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | 20 ⁰ _{-0.033} | 13 | — | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 19.8 | 14 | 62 | 103 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | 26 ⁰ _{-0.033} | 13 | — | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 22 | 14 | 62 | 107 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 26 ⁰ _{-0.033} | 13 | 9 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 25.8 | 16 | 64 | 109 |
| 40 | 24 | 21 | 22 | 41 | 14 | 32 ⁰ _{-0.039} | 16 | 10.5 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29.8 | 16 | 88 | 138 |

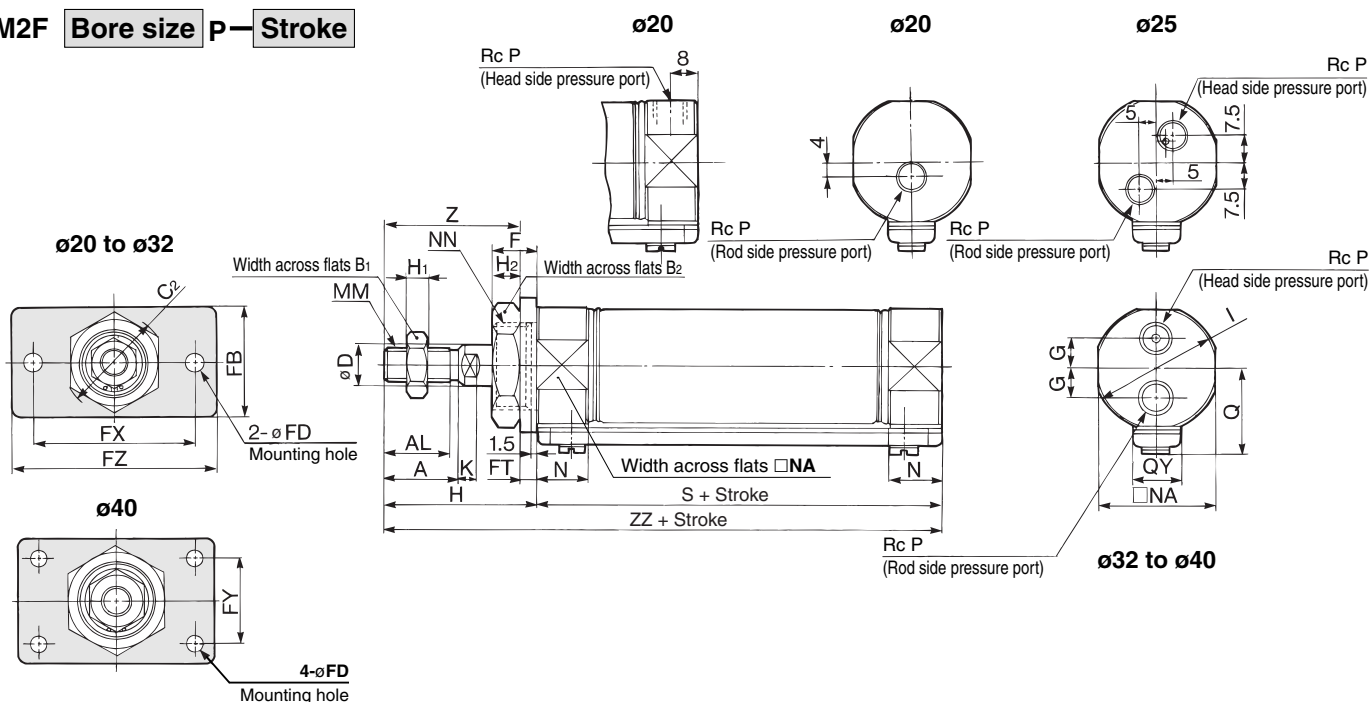
Proper Auto Switch Mounting Position and Operating Range

For proper auto switch mounting position (at stroke end), refer to page 6-4-23, since the operating range is the same as standard type, single rod.

Series CM2□P

Rod Side Flange Style (F)

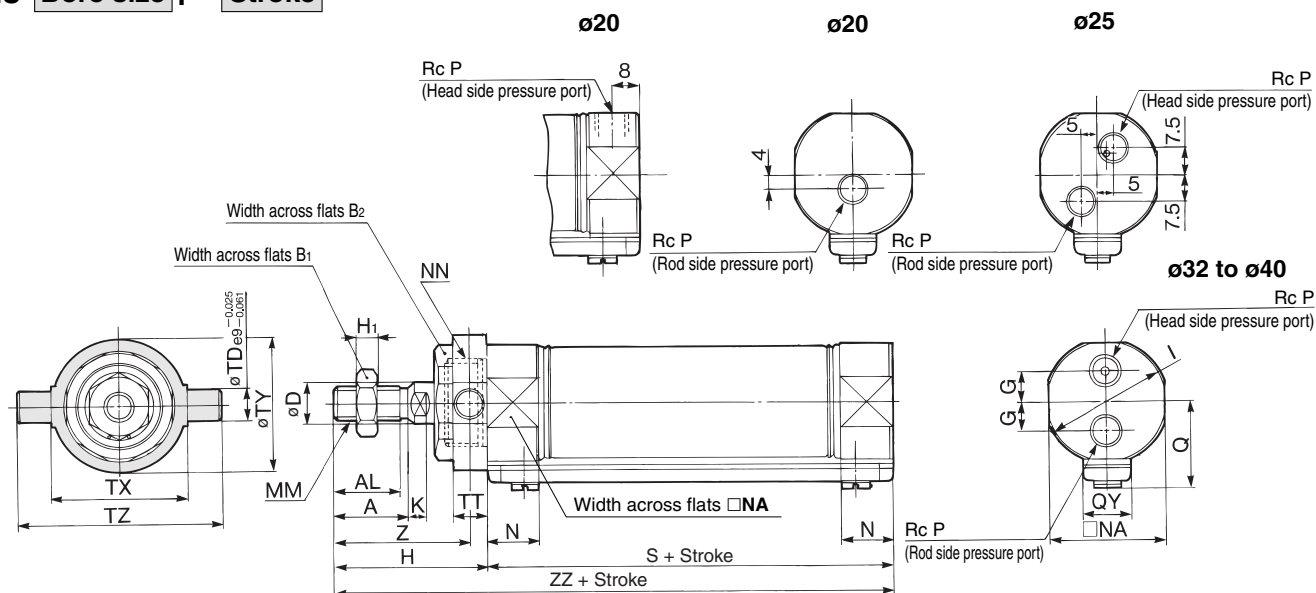
CM2F Bore size P—Stroke



| Bore size (mm) | A | AL | B ₁ | B ₂ | C ₂ | D | F | FB | FD | FT | FX | FY | FZ | G | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | Q | QY | S | Z | ZZ |
|----------------|----|------|----------------|----------------|----------------|----|----|----|----|----|----|----|----|------|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|------|----|----|----|-----|
| 20 | 18 | 15.5 | 13 | 26 | 30 | 8 | 13 | 34 | 7 | 4 | 60 | — | 75 | — | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 19.8 | 14 | 62 | 37 | 103 |
| 25 | 22 | 19.5 | 17 | 32 | 37 | 10 | 13 | 40 | 7 | 4 | 60 | — | 75 | — | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 22 | 14 | 62 | 41 | 107 |
| 32 | 22 | 19.5 | 17 | 32 | 37 | 12 | 13 | 40 | 7 | 4 | 60 | — | 75 | 9 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 25.8 | 16 | 64 | 41 | 109 |
| 40 | 24 | 21 | 22 | 41 | 47.3 | 14 | 16 | 52 | 7 | 5 | 66 | 36 | 82 | 10.5 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29.8 | 16 | 88 | 45 | 138 |

Rod Side Trunnion Style (U)

CM2U Bore size P—Stroke



| Bore size (mm) | A | AL | B ₁ | B ₂ | D | G | H | H ₁ | I | K | MM | N | NA | NN | P | Q | QY | S | TD | TT | TX | TY | TZ | Z | ZZ |
|----------------|----|------|----------------|----------------|----|------|----|----------------|------|-----|------------|------|------|-----------|-----|------|----|----|----|----|----|----|----|------|-----|
| 20 | 18 | 15.5 | 13 | 26 | 8 | — | 41 | 5 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 19.8 | 14 | 62 | 8 | 10 | 32 | 32 | 52 | 36 | 103 |
| 25 | 22 | 19.5 | 17 | 32 | 10 | — | 45 | 6 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 22 | 14 | 62 | 9 | 10 | 40 | 40 | 60 | 40 | 107 |
| 32 | 22 | 19.5 | 17 | 32 | 12 | 9 | 45 | 6 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 25.8 | 16 | 64 | 9 | 10 | 40 | 40 | 60 | 40 | 109 |
| 40 | 24 | 21 | 22 | 41 | 14 | 10.5 | 50 | 8 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29.8 | 16 | 88 | 10 | 11 | 53 | 53 | 77 | 44.5 | 138 |

Air Cylinder: With End Lock

Series *CBM2*

ø20, ø25, ø32, ø40

How to Order

Without auto switch CBM2 **L** **40** **150** **H** **N**

With auto switch CDBM2 **L** **40** **150** **H** **N** **H7BW**

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------|
| Nil | Without auto switch |
|-----|---------------------|

* For the applicable auto switch model, refer to the table below.

Manual release type

| | |
|---|---------------|
| N | Non-lock type |
| L | Lock type |

Lock position

| | |
|---|-----------------|
| H | Head end lock |
| R | Rod end lock |
| W | Double end lock |

Rod boot

| | |
|-----|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

Built-in magnet

Mounting style

| | |
|---|--------------------------|
| B | Basic style |
| L | Axial foot style |
| F | Rod side flange style |
| G | Head side flange style |
| C | Single clevis style |
| D | Double clevis style |
| U | Rod side trunnion style |
| T | Head side trunnion style |

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 6-4-92.)

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for auto switch.
Example) CDBM2L40-100-HN

Cushion

| | |
|-----|---------------|
| Nil | Rubber bumper |
| A | Air cushion |

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | | |
|--|--|------------------|-----------------|--|--------------|--------------|-------------------|------------------------|-------|-------|------------|--------------------|-----------------|------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | |
| | | Connector | | 2-wire | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | |
| | | | | | | | 100 V, 200 V | B54 ** | ● | ● | ● | — | — | | | |
| | | | | | | | — | C73C | ● | ● | ● | ● | — | | | |
| | | | | | | | — | A33A ** | — | — | — | ● | — | | | |
| | 100 V, 200 V | | | | | | A34A ** | — | — | — | ● | — | | | | |
| | | A44A ** | | | | | — | — | — | ● | — | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | — | — | Relay, PLC | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | |
| | | 3-wire (PNP) | | 12 V | | H7A2 | | ● | ● | ○ | — | ○ | | | | |
| | | Connector | | 2-wire | | 12 V | | H7B | ● | ● | ○ | — | ○ | | | |
| | | | | 3-wire (NPN) | | 5 V, 12 V | | H7C | ● | ● | ● | ● | — | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 2-wire | | 12 V | | G39A ** | — | — | — | ● | — | — | | IC circuit |
| | | | | 3-wire (NPN) | | 5 V, 12 V | | K39A ** | — | — | — | ● | — | — | | |
| | | | | 3-wire (PNP) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | | |
| | | | | Water resistant (2-color indication) | | 2-wire | | 12 V | H7PW | ● | ● | ○ | — | ○ | | — |
| | | | | | | | | H7BW | ● | ● | ○ | — | ○ | — | | |
| | | | | | | | | H7BA | — | ● | ○ | — | ○ | — | | |
| | | | | Water Diagnostic output (2-color indication) | | 3-wire (NPN) | | 5 V, 12 V | H7NF | ● | ● | ○ | — | ○ | | IC circuit |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
 ** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series CBM2

Holds the cylinder's home position even if the air supply is cut off.

When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

Non-lock type and lock type are standardized for manual release.

Auto switch is mountable.



Made to Order Specifications (For details, refer to page 6-17-1.)

| Symbol | Specifications |
|--------|--|
| -XA□ | Change of rod end shape |
| -XB6 | Heat resistant cylinder (150°C) |
| -XB9 | Low speed cylinder (10 to 50 mm/s) |
| -XC3 | Special port location |
| -XC4 * | With heavy duty scraper |
| -XC8 * | Adjustable stroke cylinder/Adjustable extension type |
| -XC13 | Auto switch mounting rail style |
| -XC22 | Fluoro rubber seals |
| -XC35 | With coil scraper |
| -XC52 | Mounting nut with set screw |

* Available only for locking at head end

Specifications

| | | |
|-------------------------------|---|-----------------|
| Type | Pneumatic | |
| Action | Double acting, Single rod | |
| Fluid | Air | |
| Proof pressure | 1.5 MPa | |
| Maximum operating pressure | 1.0 MPa | |
| Minimum operating pressure | 0.15 MPa * | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Cushion | Rubber bumper, Air cushion | |
| Lubrication | Not required (Non-lube) | |
| Thread tolerance | JIS Class 2 | |
| Stroke length tolerance | $^{+1.4}_0$ mm | |
| Piston speed | Rubber bumper | 50 to 750 mm/s |
| | Air cushion | 50 to 1000 mm/s |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style | |

* 0.05 MPa for other part than the lock unit

Lock Specifications

| Lock position | Head end, Rod end, Double end | | | |
|--------------------------|-------------------------------|-----|-----|-----|
| Holding force (Max.) (N) | ø20 | ø25 | ø32 | ø40 |
| | 215 | 330 | 550 | 860 |
| Backlash | 1 mm or less | | | |
| Manual release | Non-lock type, Lock type | | | |

Allowable Kinetic Energy

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|----------------|---|------|------|------|------|
| Rubber cushion | Allowable kinetic energy (J) | 0.27 | 0.4 | 0.65 | 1.2 |
| | Effective cushion length (mm) | 11.0 | 11.0 | 11.0 | 11.8 |
| Air cushion | Cushion sectional area (cm ²) | 2.09 | 3.30 | 5.86 | 9.08 |
| | Kinetic energy absorbable (J) | 0.54 | 0.78 | 1.27 | 2.35 |

Standard Stroke

| Bore size (mm) | Standard stroke (mm) | Long stroke * (mm) | Maximum manufacturable stroke (mm) |
|----------------|--|--------------------|------------------------------------|
| 20 | 25, 50, 75, 100, 125, 150, 200, 250, 300 | 400 | 1000 |
| 25 | | 450 | |
| 32 | | 450 | |
| 40 | | 500 | |



* Long stroke applies to the axial foot style and the rod side flange style only.
When using other types of mounting brackets or exceeding the long stroke limit, the maximum allowable stroke will be determined by the stroke selection table listed on page 6-1-9.

Minimum Stroke for Auto Switch Mounting

(mm)

| Auto switch model | No. of auto switches mounted | | | | |
|--------------------------------------|------------------------------|-----------|--|-------------------|----|
| | 2 | | n | | 1 |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...) | 50 + 45 (n - 2) | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | 60 + 45 (n - 2) | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | $15 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...) | 65 + 50 (n - 2) | 10 |
| D-B5/B6 D-G5NTL | 15 | 75 | $15 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...) | 75 + 55 (n - 2) | 10 |
| D-B59W | 20 | 75 | $20 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...) | | 15 |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | 35 + 30 (n - 2) | 100 + 100 (n - 2) | 10 |

Air Cylinder: With End Lock Series CBM2

Accessory/For details, refer to pages 6-4-21 to 22, since it is the same as Series CM2 standard type.

| | |
|--------------------|--|
| Standard equipment | Mounting nut, Rod end nut, Clevis pin, Lock release bolt (N type only) |
| Option | Single knuckle joint, Double knuckle joint (With pin) |

* Mounting nuts are not equipped to single clevis and double clevis.

Rod Boot Material

| Symbol | Rod boot material | Max. ambient temperature |
|----------|--------------------------|--------------------------|
| J | Nylon tarpaulin | 60°C |
| K | Heat resistant tarpaulin | 110°C |

* Maximum ambient temperature for the rod boot itself.

Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.14 | 0.21 | 0.28 | 0.56 |
| | Axial foot style | 0.29 | 0.37 | 0.44 | 0.83 |
| | Flange style | 0.20 | 0.30 | 0.37 | 0.68 |
| | Single clevis | 0.18 | 0.25 | 0.32 | 0.65 |
| | Double clevis style | 0.19 | 0.27 | 0.33 | 0.69 |
| | Trunnion style | 0.18 | 0.28 | 0.34 | 0.66 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |
| Accessory | Clevis bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Lock Unit Additional Weight

(kg)

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|----------------------------------|---------------------|------|------|------|------|
| Manual release non-lock type (N) | Head end lock (H) | 0.02 | 0.02 | 0.02 | 0.04 |
| | Rod end lock (R) | 0.01 | 0.01 | 0.01 | 0.02 |
| | Double end lock (W) | 0.03 | 0.03 | 0.03 | 0.06 |
| Manual release lock type (L) | Head end lock (H) | 0.03 | 0.03 | 0.03 | 0.06 |
| | Rod end lock (R) | 0.02 | 0.02 | 0.02 | 0.04 |
| | Double end lock (W) | 0.05 | 0.05 | 0.05 | 0.10 |

Calculation: (Example) CBM2L32-100-HN

- Basic weight..... 0.44 (Foot style, ø32)
- Additional weight..... 0.08/50 stroke
- Cylinder stroke..... 100 stroke
- Locking weight..... 0.02 (Locking at head end, Manual release non-locking type)
 $0.44 + 0.08 \times 100/50 + 0.02 = 0.62 \text{ kg}$

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|---|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7□/C80 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5□/B64 D-G5NTL | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |



Mounting screws set made of stainless steel

Use the following mounting screw set made of stainless steel according to operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA4: For D-C7/C8/H7 BBA3: For D-B5/B6/G5

- "D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped. When only a switch is shipped independently, "BBA4" screws are attached.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis (With pin) ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (With nut) | CM-T020B | CM-T032B | CM-T040B | |



* Two foot brackets and a mounting nut are attached.

Order two foot brackets per cylinder.

** Clevis pin and snap ring are shipped together with double clevis style.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

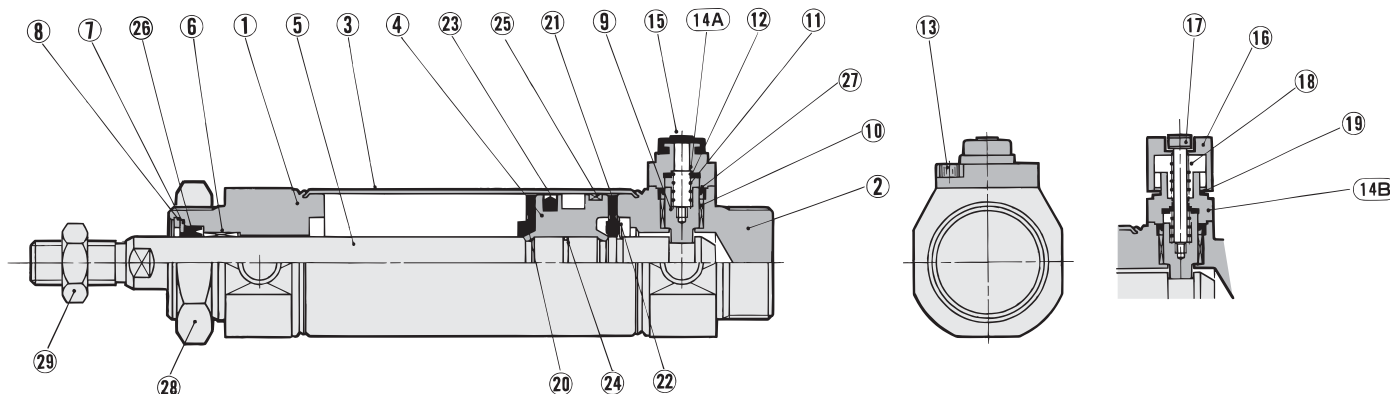
Series CBM2

Construction

Head end lock

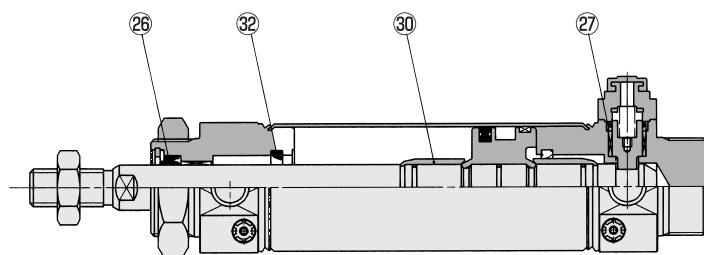
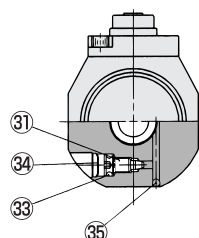
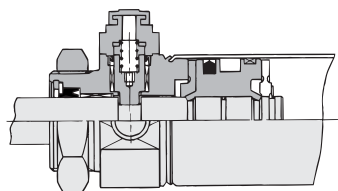
Manual release (Non-lock type): Suffix N

Manual release (Lock type): Suffix L



Rod end lock

With air cushion



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------------|--------------------------------|----------------------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cylinder tube | Stainless steel | |
| ④ | Piston | Aluminum alloy | Chromated |
| ⑤ | Piston rod | Carbon steel | Hard chrome plated |
| ⑥ | Bushing | Oil-impregnated sintered alloy | |
| ⑦ | Seal retainer | Rolled steel plate | Nickel plated |
| ⑧ | Snap ring | Carbon steel | Nickel plated |
| ⑨ | Lock piston | Carbon steel | Hard chrome plated, Heat treated |
| ⑩ | Lock bushing | Lead-bronze casted | |
| ⑪ | Lock spring | Stainless steel | |
| ⑫ | Bumper | Urethane | |
| ⑬ | Hexagon socket head cap screw | Alloy steel | Black zinc chromated |
| ⑭A | Cap A | Aluminum die-casted | Black painted |
| ⑭B | Cap B | Carbon steel | Oxide film treated |
| ⑮ | Rubber cap | Synthetic rubber | |
| ⑯ | M/O knob | Zinc die-casted | Black painted |
| ⑰ | M/O bolt | Alloy steel | Black zinc chromated |
| ⑱ | M/O spring | Steel wire | Zinc chromated |
| ⑲ | Stopper ring | Carbon steel | Zinc chromated |
| ⑳ | Bumper A | Urethane | |
| ㉑ | Bumper B | Urethane | |
| ㉒ | Snap ring | Stainless steel | |
| ㉓ | Piston seal | NBR | |
| ㉔ | Piston gasket | NBR | |
| ㉕ | Wear ring | Resin | |
| ㉘ | Mounting nut | Carbon steel | Nickel plated |
| ㉙ | Rod end nut | Carbon steel | Nickel plated |
| ㉚ | Cushion ring | Rolled steel | Electroless nickel plated |
| ㉛ | Cushion valve | Rolled steel | Electroless nickel plated |
| ㉜ | Cushion seal | Urethane | |

| No. | Description | Material | Note |
|-----|--------------------|-----------------|------|
| ㉖ | Rod seal | NBR | |
| ㉗ | Lock piston seal | NBR | |
| ㉛ | Cushion valve seal | NBR | |
| ㉜ | Snap ring | Stainless steel | |
| ㉝ | Steel balls | Stainless steel | |

Replacement Parts: Seal Kit (With lock in single end)

| Bore size (mm) | 20 | 25 | 32 | 40 |
|----------------|------------|------------|------------|------------|
| Kit no. | CBM2-20-PS | CBM2-25-PS | CBM2-32-PS | CBM2-40-PS |

Double End Lock

| Kit no. | CBM2-20-PS-W | CBM2-25-PS-W | CBM2-32-PS-W | CBM2-40-PS-W |
|---------|--------------|--------------|--------------|--------------|
|---------|--------------|--------------|--------------|--------------|

* Seal kit includes ㉖ and ㉗. Order the seal kit, based on each bore size. (Except ㉛.)

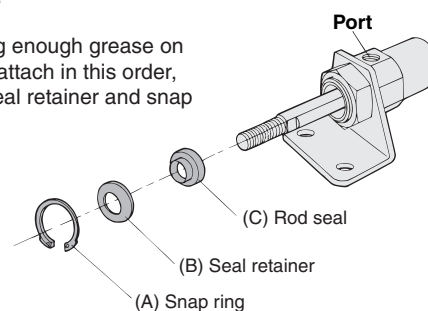
How to Change Seal Kit

<Removal>

- Remove the snap ring A by using a tool for installing a type C snap ring for hole. Shut off the port on the rod cover by finger and then pull out the piston rod, and the seal retainer B and the rod seal C are removed.

<Mounting>

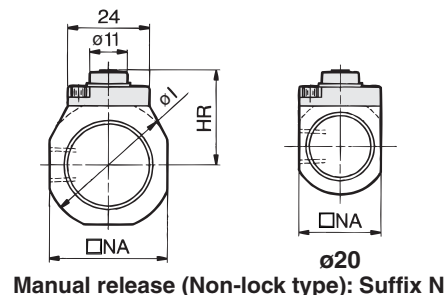
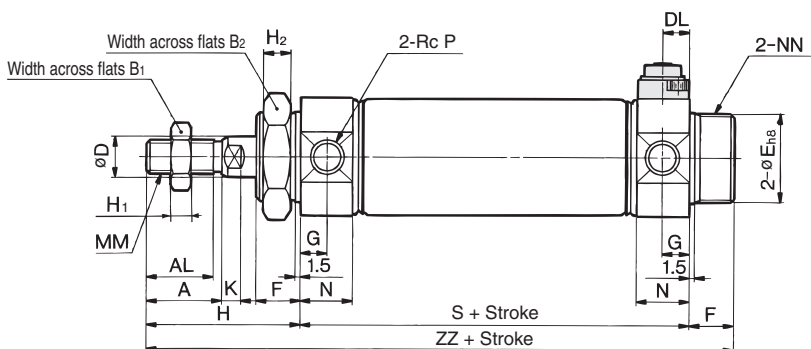
- After applying enough grease on the rod seal, attach in this order, rod seal C, seal retainer B and the snap ring A.



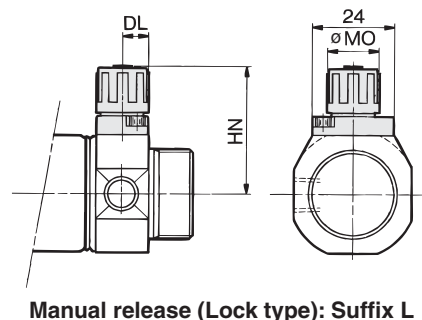
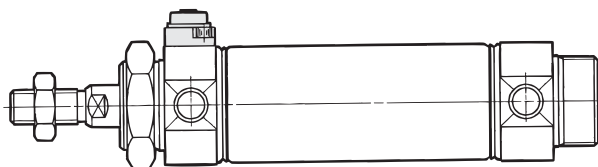
Air Cylinder: With End Lock **Series CBM2**

Basic Style (Dimensions are common irrespective of the lock position; rod end, head end, or double end.)

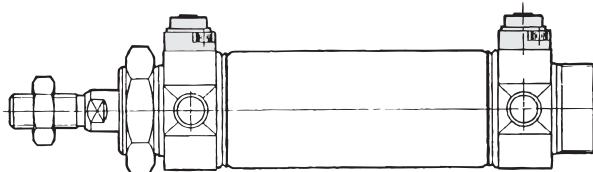
Head end lock: CBM2B **Bore size** **Stroke** **-HN**



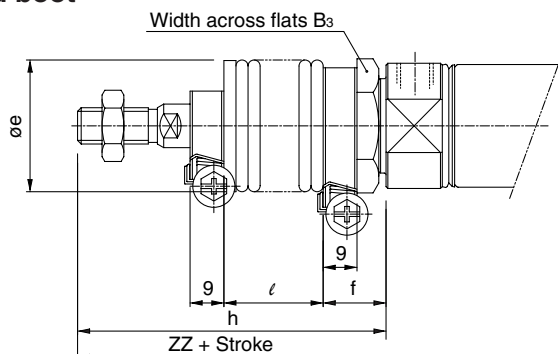
Rod end lock: CBM2B **Bore size** **Stroke** **-RN**



Double end lock: CBM2B **Bore size** **Stroke** **-WN**



With rod boot



With Rod Boot

(mm)

| ZZ | | | | | | |
|---------|-----------|------------|------------|------------|------------|------------|
| 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 143 | 156 | 168 | 181 | 206 | 231 | 256 |
| 147 | 160 | 172 | 185 | 210 | 235 | 260 |
| 149 | 162 | 174 | 187 | 212 | 237 | 262 |
| 181 | 194 | 206 | 219 | 244 | 269 | 294 |

| Symbol | Stroke range | A | AL | B ₁ | B ₂ | D | DL | E | F | G | H | H ₁ | H ₂ | HR | HN (Max.) | I | K | MM | MO | N | NA | NN | P | S | ZZ |
|--------|--------------|----|------|----------------|----------------|----|------|-----------------------------------|----|----|----|----------------|----------------|------|-----------|------|-----|------------|----|------|------|-----------|-----|----|-----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 8 | 7.5 | 20 ⁰ _{-0.033} | 13 | 8 | 41 | 5 | 8 | 22.3 | 34 | 28 | 5 | M8 x 1.25 | 15 | 15 | 24 | M20 x 1.5 | 1/8 | 62 | 116 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 10 | 7.5 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 25.3 | 37 | 33.5 | 5.5 | M10 x 1.25 | 15 | 15 | 30 | M26 x 1.5 | 1/8 | 62 | 120 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 12 | 7.5 | 26 ⁰ _{-0.033} | 13 | 8 | 45 | 6 | 8 | 27.6 | 39.3 | 37.5 | 5.5 | M10 x 1.25 | 15 | 15 | 34.5 | M26 x 1.5 | 1/8 | 64 | 122 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 14 | 10.7 | 32 ⁰ _{-0.039} | 16 | 11 | 50 | 8 | 10 | 33.6 | 47.8 | 46.5 | 7 | M14 x 1.5 | 19 | 21.5 | 42.5 | M32 x 2 | 1/4 | 88 | 154 |

With Rod Boot

| Symbol | B ₃ | e | f | h | | | | | | | ℓ | | | | | | |
|----------------|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| Bore size (mm) | | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 30 | 36 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | 181 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |
| 25 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |
| 32 | 32 | 36 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |
| 40 | 41 | 46 | 19 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |

* For details about the rod end nut and accessory, refer to pages 6-4-21 to 6-4-22.



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

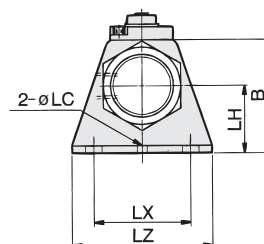
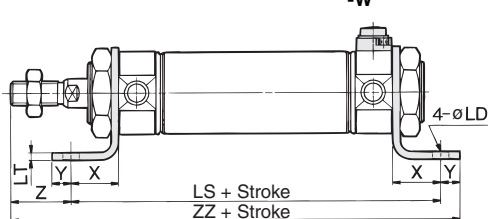
20-

Data

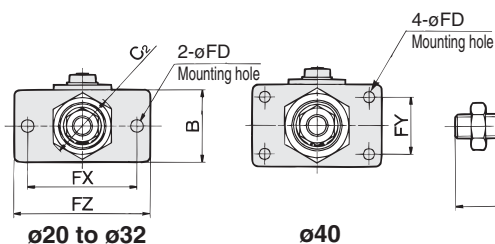
Series CBM2

With Mounting Bracket (For dimensions not indicated below, refer to page 6-4-95.)

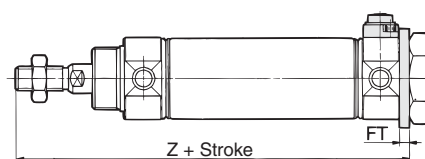
Axial foot style: CBM2L Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$



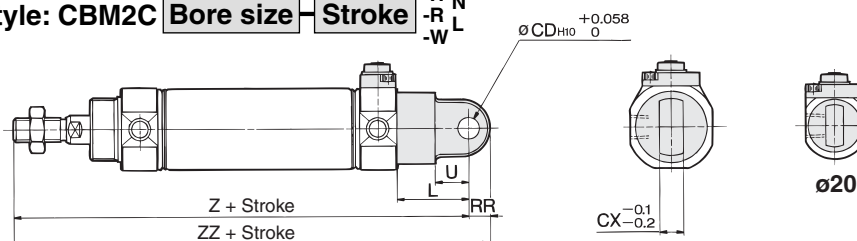
Rod side flange style: CBM2F Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$



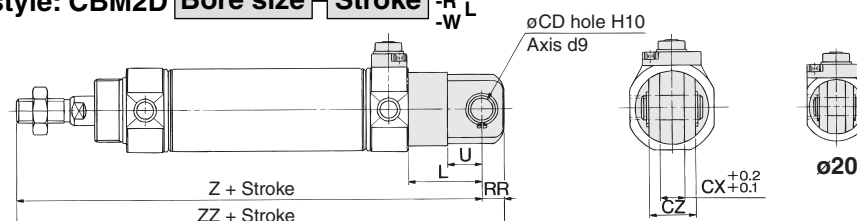
Head side flange style: CBM2G Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$



Single clevis style: CBM2C Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$

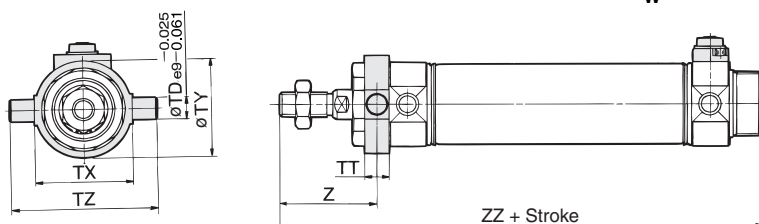


Double clevis style: CBM2D Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$

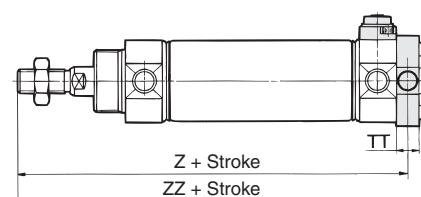


* Clevis pin and snap ring (cotter pin for bore size 40) are shipped together.

Rod side trunnion style: CBM2U Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$



Head side trunnion style: CBM2T Bore size — Stroke $\begin{matrix} -H \\ -R \\ -L \\ -W \end{matrix}$



| Bore size (mm) | Axial foot style | | | | | | | | | | | | | Flange style | | | | | | | | | | | | Clevis style | | | | | | | | | | | | Trunnion style | | | | | | | | | | | |
|----------------------|------------------|----|----|-----|----|-----|-----|----|----|----|----|----|-----|--------------|-----------|----|----------------|----|----|----|----|----|----------|-----------|-----------------|--------------|----|----|----|----|----|-----|-----|-----------------|----|----|----|----------------|----|----------|-----------|----------|-----------|----------|-----------|--|--|--|--|
| | Stroke range | B | LC | LD | LH | LS | LT | LX | LZ | X | Y | Z | ZZ | Stroke range | | B | C ₂ | FD | FT | FX | FY | FZ | Z | | Stroke range | CD | CX | CZ | L | RR | U | Z | ZZ | Stroke range | TD | TT | TX | TY | TZ | Z | | ZZ | | | | | | | |
| | | | | | | | | | | | | | | Rod side | Head side | | | | | | | | Rod side | Head side | | | | | | | | | | | | | | | | Rod side | Head side | Rod side | Head side | Rod side | Head side | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Up to 400 | 40 | 4 | 6.8 | 25 | 102 | 3.2 | 40 | 55 | 20 | 8 | 21 | 131 | Up to 400 | Up to 300 | 34 | 30 | 7 | 4 | 60 | — | 75 | 37 | 107 | Up to 300 | 9 | 10 | 19 | 30 | 9 | 14 | 133 | 142 | Up to 300 | 8 | 10 | 32 | 32 | 52 | 36 | 108 | 116 | 118 | | | | | | |
| 25 | Up to 450 | 47 | 4 | 6.8 | 28 | 102 | 3.2 | 40 | 55 | 20 | 8 | 25 | 135 | Up to 450 | Up to 300 | 40 | 37 | 7 | 4 | 60 | — | 75 | 41 | 111 | Up to 300 | 9 | 10 | 19 | 30 | 9 | 14 | 137 | 146 | Up to 300 | 9 | 10 | 40 | 40 | 60 | 40 | 112 | 120 | 122 | | | | | | |
| 32 | Up to 450 | 47 | 4 | 6.8 | 28 | 104 | 3.2 | 40 | 55 | 20 | 8 | 25 | 137 | Up to 450 | Up to 300 | 40 | 37 | 7 | 4 | 60 | — | 75 | 41 | 113 | Up to 300 | 9 | 10 | 19 | 30 | 9 | 14 | 139 | 148 | Up to 300 | 9 | 10 | 40 | 40 | 60 | 40 | 114 | 122 | 124 | | | | | | |
| 40 | Up to 500 | 54 | 4 | 7 | 30 | 134 | 3.2 | 55 | 75 | 23 | 10 | 27 | 171 | Up to 500 | Up to 300 | 52 | 47.3 | 7 | 5 | 66 | 36 | 82 | 45 | 143 | Up to 300 | 10 | 15 | 30 | 39 | 11 | 18 | 177 | 188 | Up to 300 | 10 | 11 | 53 | 53 | 77 | 44.5 | 143.5 | 154 | 154 | | | | | | |

* Dimensions except mentioned above are the same as standard type.

Precautions on Trunnion Style, Flange Style

1. Trunnion style

(1) With lock in rod side of the rod side trunnion style (2) With lock in head side of the head side trunnion style (3) With lock in both sides. For above cases, use caution since the trunnion pin and fittings may be interfered with each other because the trunnion pin and port are very closed to each other.

2. Flange style (ø20 to ø32)

(1) With lock in rod side of the rod side flange style (2) With lock in head side of the head side flange style (3) With lock in both sides. For above cases, use caution since the bolt for mounting a cylinder and fittings may be interfered with each other. Refer to "Special Port Position" in "Made to Order Specifications" on page 6-17-36.

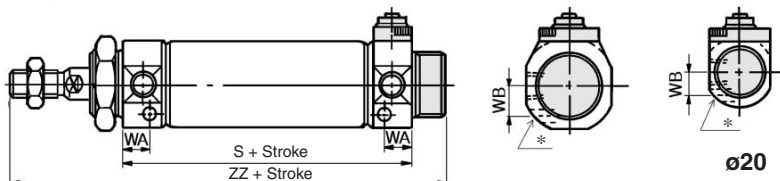
Air Cylinder: With End Lock Series **CBM2**

With Air Cushion (Dimensions not mentioned in the below table are the same as the above table.)

Basic style

Head end lock: **CBM2B** Bore size Stroke A-HN

* R Cushion valve
Width across hexagon socket hole 1.5

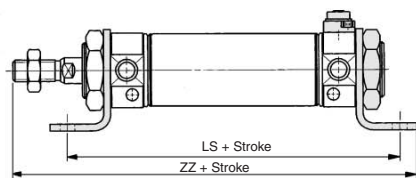


Manual release (Non-lock type): Suffix N

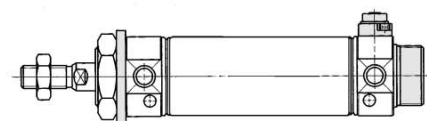
With Air Cushion

| Bore size (mm) | S | | | WA | WB | ZZ | | |
|-------------------|---------------|--------------|-----------------|----|------|---------------|--------------|-----------------|
| | Head end lock | Rod end lock | Double end lock | | | Head end lock | Rod end lock | Double end lock |
| 20 | 72 | 73 | 83 | 13 | 8.5 | 126 | 127 | 137 |
| 25 | 72 | 73 | 83 | 13 | 10.5 | 130 | 131 | 141 |
| 32 | 72 | 75 | 83 | 13 | 11.5 | 130 | 133 | 141 |
| 40 | 93 | 96 | 101 | 16 | 15 | 159 | 162 | 167 |

Axial foot style: **CBM2L** Bore size Stroke A^{-H}_{-R}_{-L}^N

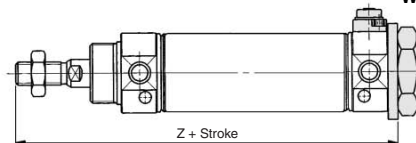


Rod side flange style: **CBM2F** Bore size Stroke A^{-H}_{-R}_{-L}^N

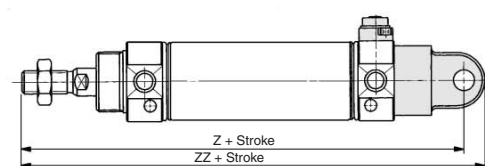


Head side flange style:

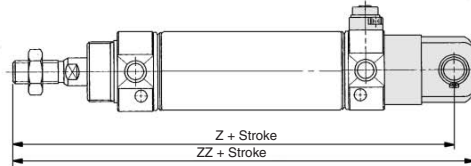
CBM2G Bore size Stroke A^{-H}_{-R}_{-L}^N



Single clevis style: **CBM2C** Bore size Stroke A^{-H}_{-R}_{-L}^N

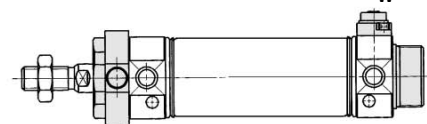


Double clevis style: **CBM2D** Bore size Stroke A^{-H}_{-R}_{-L}^N



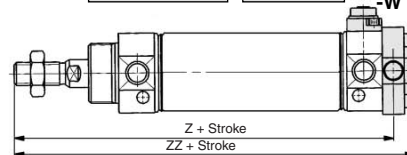
Rod side trunnion style:

CBM2U Bore size Stroke A^{-H}_{-R}_{-L}^N



Head side trunnion style:

CBM2T Bore size Stroke A^{-H}_{-R}_{-L}^N



| Bore size (mm) | Axial foot style | | | | | | Head side flange style | | |
|-------------------|------------------|--------------|-----------------|---------------|--------------|-----------------|------------------------|--------------|-----------------|
| | LS | | | ZZ | | | Z | | |
| | Head end lock | Rod end lock | Double end lock | Head end lock | Rod end lock | Double end lock | Head end lock | Rod end lock | Double end lock |
| 20 | 112 | 113 | 123 | 141 | 142 | 152 | 117 | 118 | 128 |
| 25 | 112 | 113 | 123 | 145 | 146 | 156 | 121 | 122 | 132 |
| 32 | 112 | 115 | 123 | 145 | 148 | 156 | 121 | 124 | 132 |
| 40 | 139 | 142 | 147 | 176 | 179 | 184 | 148 | 151 | 156 |

| Bore size (mm) | Clevis style | | | | | | Head side trunnion style | | | | | |
|-------------------|---------------|--------------|-----------------|---------------|--------------|-----------------|--------------------------|--------------|-----------------|---------------|--------------|-----------------|
| | Z | | | ZZ | | | Z | | | ZZ | | |
| | Head end lock | Rod end lock | Double end lock | Head end lock | Rod end lock | Double end lock | Head end lock | Rod end lock | Double end lock | Head end lock | Rod end lock | Double end lock |
| 20 | 143 | 144 | 154 | 152 | 153 | 163 | 118 | 119 | 129 | 128 | 129 | 139 |
| 25 | 147 | 148 | 158 | 156 | 157 | 167 | 122 | 123 | 133 | 132 | 133 | 143 |
| 32 | 147 | 150 | 158 | 156 | 159 | 167 | 122 | 125 | 133 | 132 | 135 | 143 |
| 40 | 182 | 185 | 190 | 193 | 196 | 201 | 148.5 | 151.5 | 156.5 | 159 | 162 | 167 |

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

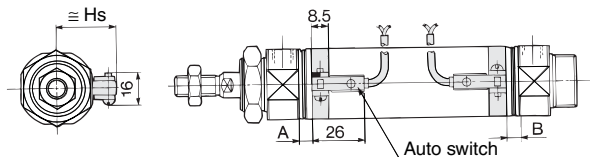
Data

Series CBM2

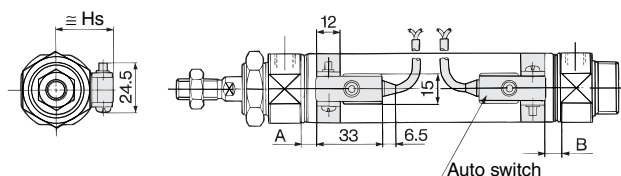
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Reed switch

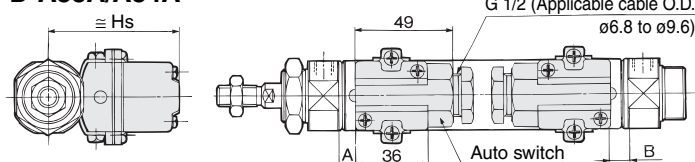
D-C7□/C80



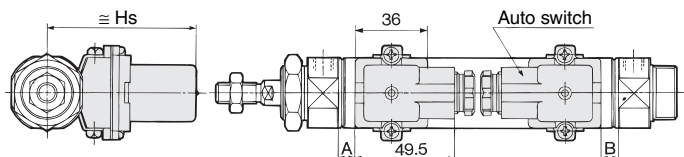
D-B5□/B64/B59W



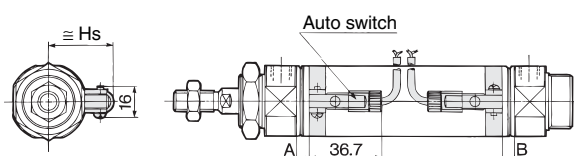
D-A33A/A34A



D-A44A

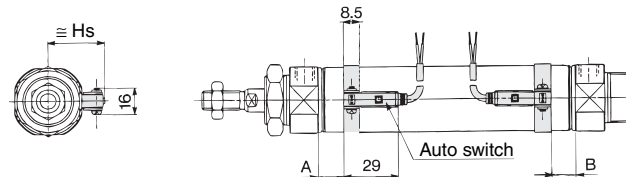


D-C73C/C80C

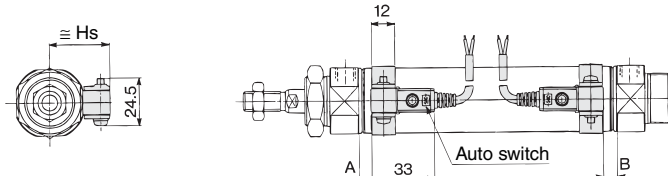


Solid state switch

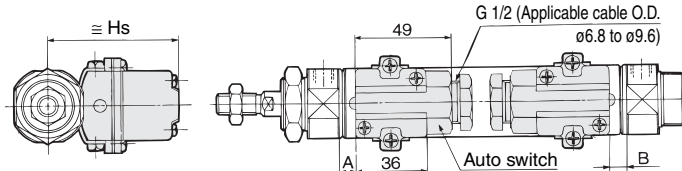
D-H7□/H7□W/H7NF/H7BAL



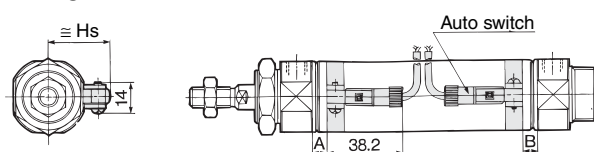
D-G5NTL



D-G39A/K39A



D-H7C



Proper Auto Switch Mounting Position

| Auto switch model Bore size (mm) | D-B5□ D-B64 | | D-C7□ D-C80 D-C73C D-C80C | | D-B59W | | D-A3□A D-G39A D-K39A D-A44A | | D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF | | D-G5NTL | |
|-------------------------------------|----------------|------|------------------------------------|------|--------|------|--------------------------------------|--------|---|------|----------|----------|
| | A | B | A | B | A | B | A | B | A | B | A | B |
| 20 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 25 | 1(—) | 0(—) | 7(5) | 6(4) | 4(2) | 3(1) | 0.5(—) | 0(—) | 6(4) | 5(3) | 2.5(0.5) | 1.5(0) |
| 32 | 2(0) | 1(0) | 8(6) | 7(5) | 5(3) | 4(2) | 1.5(0) | 0.5(0) | 7(5) | 6(4) | 3.5(1.5) | 2.5(0.5) |
| 40 | 7 | 6 | 13 | 12 | 10 | 9 | 6.5 | 5.5 | 12 | 11 | 8.5 | 7.5 |

* (): Denotes the values with air cushion "D-B5/B6/A3□A/A44A/G39A and K39A" cannot be mounted on bore size ø20 and ø25 cylinder with air cushion.

Auto Switch Mounting Height

| D-B5□ D-B64 D-B59W D-G5NTL D-H7C | D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF | D-C73C D-C80C | D-A3□A D-G39A D-K39A | D-A44A |
|--|--|------------------|----------------------------|--------|
| Hs | Hs | Hs | Hs | Hs |
| 25.5 | 22.5 | 25 | 60 | 69.5 |
| 28 | 25 | 27.5 | 62.5 | 72 |
| 31.5 | 28.5 | 31 | 66 | 75.5 |
| 35.5 | 32.5 | 35 | 70 | 79.5 |

Operating Range

| Auto switch model | Bore size (mm) | | | |
|--------------------------|----------------|-----|-----|-----|
| | 20 | 25 | 32 | 40 |
| D-C7□/C80 D-C73C/C80C | 7 | 8 | 8 | 8 |
| D-A3□A/A44A D-B5□/B64 | 8 | 8 | 9 | 9 |
| D-B59W | 12 | 12 | 13 | 13 |
| D-H7BAL, D-H7□/H7□W/H7NF | 4 | 4 | 4.5 | 4.5 |
| D-H7C | 7 | 8.5 | 9 | 10 |
| D-G39A/K39A | 8 | 9 | 9 | 9 |
| D-G5NTL | 4 | 4 | 4.5 | 4.5 |

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

| Type | Model | Electrical entry | Features |
|--------------------|---------|------------------|-------------------------|
| Reed switch | D-C80 | Grommet | Without indicator light |
| | D-C80C | Connector | |
| | D-B53 | Grommet | — |
| | D-B64 | Grommet | Without indicator light |
| Solid state switch | D-G5NTL | Grommet | With timer |

* With pre-wire connector is available for D-G5NTL type, too. Refer to page 6-16-55 for details.

* Wide range detection type, solid state auto switch (D-G5NBL type) is also available. For details, refer to page 6-16-59.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

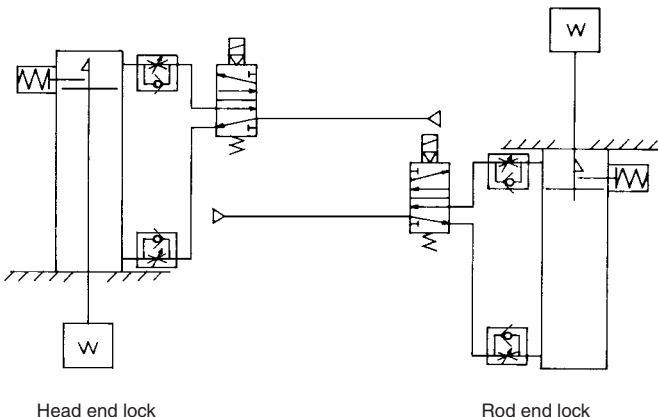
⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 6-20-3 to 6.

Use the Recommended Pneumatic Circuit

⚠ Caution

- This is necessary for proper operation and release of the lock.



Operating Precautions

⚠ Caution

- Do not use 3 position solenoid valves.**
Avoid use in combination with 3 position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.
- Back pressure is required to release end lock.**
Be sure air is supplied to side of cylinder without the locking mechanism, as above, prior to supplying air pressure to the side with end lock or lock may not be released. (Refer to "Releasing the Lock".)
- Release the lock when mounting or adjusting the cylinder.**
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.
- Operate with a load ratio of 50% or less.**
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.
- Do not operate multiple cylinders in synchronization.**
Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.
- Use a speed controller with meter-out control.**
Lock cannot be released occasionally by meter-in control.
- Be sure to operate completely to the cylinder stroke end on the side with the lock.**
If the cylinder piston does not reach the end of the stroke, locking might not work or locking might not be released.

Operating Pressure

⚠ Caution

1. Use pressures over 0.15 MPa at port with locking mechanism.

Exhaust Speed

⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

Relation to Cushion

⚠ Caution

1. When cushion valve at side with locking mechanism is fully opened or closed, piston rod may reached at stroke end. Thus lock is not established. And when locking is done at cushion valve fully closed, adjust cushion valve since lock may not be released.

Releasing the Lock

⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the piston rod is very dangerous.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 6-20-3 to 6.1

Manual Release

⚠ Caution

1. Manual release (Non-lock type)

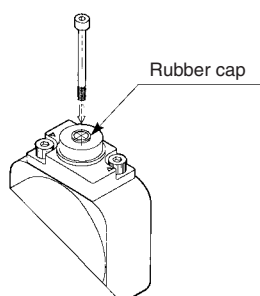
Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

Thread sizes, pulling forces and strokes are as shown below.

| Bore size (mm) | Thread size | Pulling force | Stroke (mm) |
|-------------------|--------------------------|---------------|-------------|
| 20, 25, 32 | M2.5 x 0.45 x 25 or more | 4.9 N | 2 |
| 40, 50, 63 | M3 x 0.5 x 30 or more | 10 N | 3 |
| 80, 100 | M5 x 0.8 x 40 or more | 24.5 N | 3 |

Remove the bolt for normal operation.

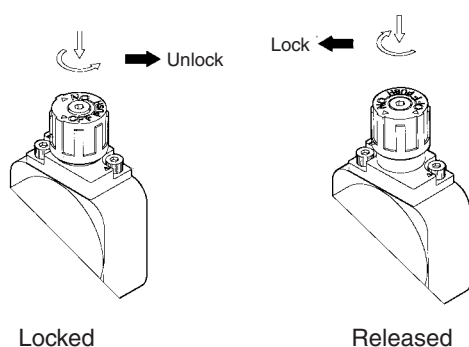
It can cause lock malfunction or faulty release.



2. Manual release (Lock type)

While pushing the M/O knob, turn it 90° counterclockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼ OFF mark on the M/O knob. When locking is desired, turn M/O button clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on M/O button. The correct position is confirmed by a click sound "click".

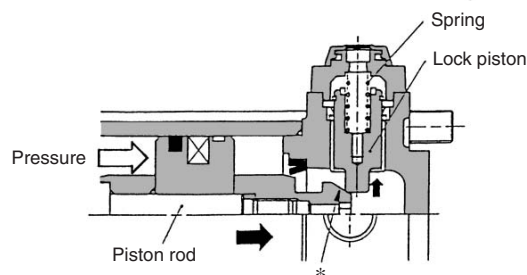
If not confirmed, locking is not done.



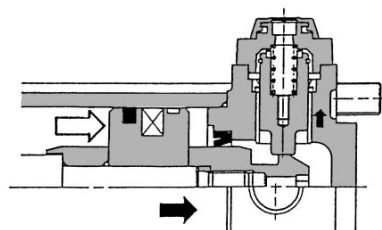
Working Principle

● Head end lock (Rod end lock is the same, too.)

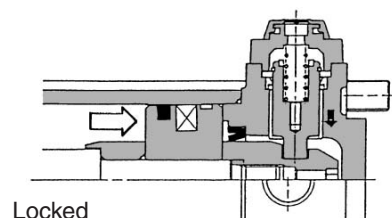
- When the piston rod is getting closer to the stroke end, the taper part (*) of the piston rod edge will push the lock piston up.



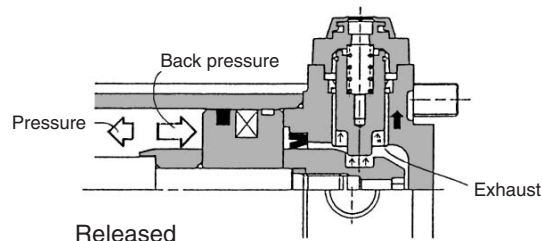
- Lock piston is pushed up further.



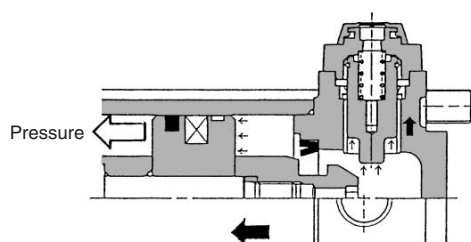
- Lock piston is pushed up into the groove of piston rod to lock it. (Lock piston is pushed up by spring force.) At this time, it is exhausted from port in head side and introduced to atmosphere.



- When pressure is supplied in the head side, lock piston will be pushed up to release the lock.



- Lock will be released, then cylinder will move forward.



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



The external dimensions and the related things about auto switches are the same as standard type, double acting, single rod. For Series CM2, refer to Best Pneumatics Vol. 6.

Low Speed Cylinder

Double Acting, Single Rod

Series CM2X

ø20, ø25, ø32, ø40

How to Order

Mounting style

| | | | |
|----------|-------------------------|-----------|----------------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut rod side flange style |
| C | Single clevis style | UZ | Boss-cut rod side trunnion style |
| D | Double clevis style | | |
| U | Rod side trunnion style | | |

Standard stroke
Refer to "Standard Stroke" on page 10-3-15.

Without auto switch CM2X L 40 150

With auto switch CDM2X L 40 150 H7BW

Built-in magnet

Low speed cylinder

Bore size

| | |
|----|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Number of auto switches

| | |
|-----|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|-----|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|-----|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m)* | | | | Pre-wire connector | Applicable load | | | | | |
|--------------------|---|------------------|-----------------|-------------------------|--------------|--------------|-------------------|-----------------------|-------|-------|----------|--------------------|-----------------|------------|------------|------------|--|--|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — | | | |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | | | | |
| | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | | | | | |
| | | | | | | — | C73C | ● | ● | ● | ● | — | | | | | | |
| | | | | | | — | A33A | — | — | — | ● | — | | | | | | |
| | 100 V, 200 V | | | | | A34A | — | — | — | ● | — | | | | | | | |
| | A44A | — | | — | — | ● | — | Relay, PLC | | | | | | | | | | |
| — | — | B59W | ● | ● | — | — | — | | | | | | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC | | | |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | | | | |
| | | 2-wire | | H7B | | | | ● | ● | ○ | — | ○ | | | | | | |
| | | | | H7C | | | | ● | ● | ● | ● | — | — | | | | | |
| | | 3-wire (NPN) | | 5 V, 12 V | | | | G39A | — | — | — | ● | — | | | IC circuit | | |
| | 2-wire | 12 V | | K39A | | — | | — | — | ● | — | — | | | | | | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | | | | |
| | | | | 3-wire (PNP) | | | | H7PW | ● | ● | ○ | — | ○ | | | | | |
| | | | | 2-wire | | | | H7BW | ● | ● | ○ | — | ○ | | | | | |
| | | | | | | | | H7BA | — | ● | ○ | — | ○ | | | | | |
| | | | | | | | | H7NF | ● | ● | ○ | — | ○ | | | IC circuit | | |
| | Water resistant (2-color indication) | | | | | | | | | | | | | | | | | |
| | With diagnostic output (2-color indication) | | | | | | | | | | | | | | | | | |

* Lead wire length symbols: 0.5 m Nil (Example) C73C
3 m L (Example) C73CL
5 m Z (Example) C73CZ
None N (Example) C73CN

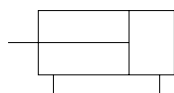
* Solid state switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.

- Since there are other applicable auto switches than listed, refer to Best Pneumatics Vol. 6 for details.
- For details about auto switches with pre-wire connector, refer to page 10-20-66.

Low Speed Cylinder Double Acting, Single Rod Series CM2X



JIS Symbol
Double acting
Single rod



Standard Stroke

| Bore size (mm) | Standard stroke (mm) <small>Note)</small> |
|----------------|---|
| 20 | |
| 25 | 25, 50, 75, 100, 125, 150 |
| 32 | 200, 250, 300 |
| 40 | |

Note) Other intermediate strokes can be manufactured upon receipt of order.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 10-24-3 to 10-24-6.

Operating Precautions

⚠ Warning

1. Do not rotate the cover.
 - When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover rotated.

⚠ Caution

1. Be careful of the snap ring to pop out.
 - When replacing the rod seal, take care that the snap ring does not spring out while you are removing it.

Maintenance

⚠ Caution

1. Replacement parts/Seal kit
Order it in accordance with the bore size.

| Bore size (mm) | Kit no. | Contents |
|----------------|-----------|---------------------------|
| 20 | CM2X20-PS | |
| 25 | CM2X25-PS | Rod seal: 1 pc. |
| 32 | CM2X32-PS | |
| 40 | CM2X40-PS | Grease pack (10 g): 1 pc. |

2. Grease pack

When maintenance requires only grease, use the following part numbers to order.

Grease pack
GR-L-005 (5 g)
GR-L-010 (10 g)
GR-L-150 (150 g)

Specifications

| | |
|-------------------------------|---|
| Bore size (mm) | 20, 25, 32, 40 |
| Type | Pneumatic |
| Action | Double acting, Single rod |
| Fluid | Air |
| Proof pressure | 1.5 MPa |
| Maximum operating pressure | 1.0 MPa |
| Minimum operating pressure | 0.025 MPa |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) |
| Cushion | Rubber bumper |
| Piping | Screw-in type |
| Lubrication | Not required (Non-lube) |
| Thread tolerance | JIS Class 2 |
| Stroke length tolerance | +1.4 0 |

Piston Speed

| Bore size (mm) | 20 | 25 | 32 | 40 |
|------------------------------|------------|-----|------|-----|
| Piston speed (mm/s) | 0.5 to 300 | | | |
| Allowable kinetic energy (J) | 0.27 | 0.4 | 0.65 | 1.2 |

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-----------------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis (with pin) ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (with nut) | CM-T020B | CM-T032B | CM-T040B | |

* When ordering foot bracket, order 2 pieces per cylinder.

** Clevis pin and snap ring (cotter pin for ø40) are shipped together.

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|--------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7/C8, D-H7 | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5/B6, D-G5 | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□A/A44A, D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |

Mounting Style and Accessory

| Accessory | Standard equipment | | | Option | | |
|------------------------------------|--------------------|-------------|------------|----------------------|-------------------------------------|----------------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis bracket |
| Mounting | | | | | | |
| Basic style | ● (1 pc.) | ● | — | ● | ● | — |
| Axial foot style | ● (2) | ● | — | ● | ● | — |
| Rod side flange style | ● (1) | ● | — | ● | ● | — |
| Head side flange style | ● (1) | ● | — | ● | ● | — |
| Clevis integrated style | — (1) | ● | — | ● | ● | ● |
| Single clevis style | — (1) | ● | — | ● | ● | — |
| Double clevis style ⁽³⁾ | — (1) | ● | ● | ● | ● | — |
| Rod side trunnion style | ● (1) (2) | ● | — | ● | ● | — |
| Head side trunnion style | ● (1) (2) | ● | — | ● | ● | — |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — |
| Boss-cut trunnion style | ● (1) | ● | — | ● | ● | — |
| Note | | | | | With pin | With pin |

Note 1) Mounting nut is not equipped with clevis integrated style, single clevis style and double clevis style.

Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.

Note 3) Pin and snap ring are shipped together with double clevis and double knuckle joint. (ø40 is cotter pin.)

Fine Lock Cylinder

Double Acting, Single Rod

Series *CLM2*

ø20, ø25, ø32, ø40

How to Order

Without auto switch

CLM2 H L 25 — 100 J — E

With auto switch

CDLM2 H L 25 — 100 J — E — H7BW

Built-in magnet

Type

| | |
|-----|-----------|
| Nil | Pneumatic |
| H | Air-hydro |

Mounting style

| | | | |
|----------|------------------------|-----------|--------------------------|
| B | Basic style | T | Head side trunnion style |
| L | Axial foot style | E | Clevis integrated style |
| F | Rod side flange style | BZ | Boss-cut basic style |
| G | Head side flange style | FZ | Boss-cut flange style |
| C | Single clevis style | | |
| D | Double clevis style | | |

Bore size

| | |
|-----------|-------|
| 20 | 20 mm |
| 25 | 25 mm |
| 32 | 32 mm |
| 40 | 40 mm |

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 9-2-18.

Lock operation

| | |
|----------|--------------------------------------|
| E | Spring locking (Exhaust locking) |
| P | Pneumatic locking (Pressure locking) |
| D | Spring and pneumatic locking |

With rod boot

| | |
|------------|--------------------------|
| Nil | None |
| J | Nylon tarpaulin |
| K | Heat resistant tarpaulin |

Number of auto switches

| | |
|------------|----------|
| Nil | 2 pcs. |
| S | 1 pc. |
| n | "n" pcs. |

Auto switch

| | |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |
|------------|---------------------------------------|

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 9-15-1 for further information on auto switches.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | Lead wire length (m) * | | | | Pre-wire connector | Applicable load | | |
|--|--|------------------|-----------------|---|--------------|--------------|-------------------|------------------------|-------|-------|------------|--------------------|-----------------|------------|------------|
| | | | | | DC | AC | | 0.5 (Nil) | 3 (L) | 5 (Z) | None (N) | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | C76 | ● | ● | — | — | — | IC circuit | — |
| | | 2-wire | | 24 V | 12 V | 100 V | C73 | ● | ● | ● | — | — | — | Relay, PLC | |
| | | | | | | 100 V, 200 V | B54 | ● | ● | ● | — | — | | | |
| | | | | | | — | C73C | ● | ● | ● | ● | — | | | |
| | | | | | | — | A33A | — | — | — | ● | — | | | |
| | 100 V, 200 V | | | | | A34A | — | — | — | — | — | | | | |
| | A44A | — | | — | — | ● | — | | | | | | | | |
| Diagnostic indication (2-color indication) | Grommet | — | — | B59W | ● | ● | — | — | — | | | | | | |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | H7A1 | ● | ● | ○ | — | ○ | IC circuit | Relay, PLC |
| | | 3-wire (PNP) | | H7A2 | | | | ● | ● | ○ | — | ○ | | | |
| | | 2-wire | | H7B | | | | ● | ● | ○ | — | ○ | | | |
| | | — | | H7C | | | | ● | ● | ● | ● | — | — | | |
| | | — | | G39A | | | | — | — | — | ● | — | IC circuit | | |
| | Connector | 2-wire | | 12 V | | K39A | | — | — | — | ● | — | — | — | |
| | Diagnostic indication (2-color indication) | Grommet | | 3-wire (NPN) | | 5 V, 12 V | | H7NW | ● | ● | ○ | — | ○ | IC circuit | |
| | | | | 3-wire (PNP) | | 5 V, 12 V | | H7PW | ● | ● | ○ | — | ○ | | |
| | | | | 2-wire | | 12 V | | H7BW | ● | ● | ○ | — | ○ | | |
| | | | | — | | H7BA | | — | ● | ○ | — | ○ | | | |
| | | | | — | H7NF | ● | ● | ○ | — | ○ | IC circuit | | | | |
| | | | | Water resistant (2-color indication) | | | | | | | | | | | |
| | | | | With diagnostic output (2-color indication) | | | | | | | | | | | |

- * Lead wire length symbols: 0.5 m.....Nil (Example) C73C
 1 m..... L (Example) C73CL
 5 m..... Z (Example) C73CZ
 None..... N (Example) C73CN
- * Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
- Since there are other applicable auto switches than listed, refer to page 9-2-20 for details.
 - For details about auto switches with pre-wire connector, refer to page 9-15-66.

Series CLM2

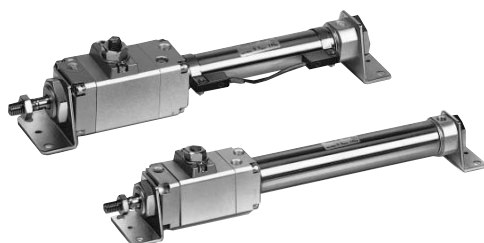
Provided with a compact lock mechanism, it is suitable for intermediate stop, emergency stop, and drop prevention.

Locking in both directions

The piston rod can be locked in either direction of its cylinder stroke.

Maximum piston speed: 500 mm/s

It can be used at 50 to 500 mm/s provided that it is within the allowable kinetic energy range.



Made to Order Specifications
(For details, refer to page 7-16-1.)

| Symbol | Specifications |
|--------|-------------------------|
| -XA□ | Change of rod end shape |

Rod Boot Material

| Symbol | Rod boot material | Maximum ambient temperature |
|--------|--------------------------|-----------------------------|
| J | Nylon tarpaulin | 70°C |
| K | Heat resistant tarpaulin | 110°C * |

* Maximum ambient temperature for the rod boot itself.

Specifications

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------------------|--|----|----|--------|
| Action | Double acting, Single rod | | | |
| Type | Air cylinder | | | |
| Lock operation | Spring locking (Exhaust locking) Pneumatic locking (Pressurized locking), Spring and pneumatic locking | | | |
| Fluid | Air | | | |
| Proof pressure | 1.5 MPa | | | |
| Maximum operating pressure | 1.0 MPa | | | |
| Minimum operating pressure | 0.08 MPa | | | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | | | |
| Lubrication | Not required (Non-lube) | | | |
| Piston speed | 50 to 500 mm/s * | | | |
| Thread tolerance | JIS Class 2 | | | |
| Stroke length tolerance | +1.4 0 | | | |
| Piping/Screw-in type | Rc 1/8 | | | Rc 1/4 |
| Mounting | Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Head side trunnion style, Clevis integrated style, Boss cut style, Boss-cut flange style | | | |

* Constraints associated with the allowable kinetic energy are imposed on the speeds at which the piston can be locked.
The maximum speed of 750 mm/s can be accommodated if the piston is to be locked in the stationary state for the purpose of drop prevention.

Fine Lock Specifications

| Lock operation | Spring locking (Exhaust locking) | Spring and pneumatic locking | Pneumatic locking (Pressure locking) |
|----------------------------|----------------------------------|------------------------------|--------------------------------------|
| Fluid | Air | | |
| Maximum operating pressure | 0.5 MPa | | |
| Unlocking pressure | 0.3 MPa or more | | 0.1 MPa or more |
| Lock starting pressure | 0.25 MPa or less | | 0.05 MPa or more |
| Locking direction | Both directions | | |

Standard Stroke

| Bore size (mm) | Standard stroke ⁽¹⁾ (mm) | Long stroke ⁽²⁾ (mm) | Maximum stroke (mm) |
|----------------|--|---------------------------------|---------------------|
| 20 | 25, 50, 75, 100, 125, 150, 200, 250, 300 | 400 | 1000 |
| 25 | | 450 | |
| 32 | | 450 | |
| 40 | | 500 | |

Note 1) Intermediate stroke is available, too.

Note 2) The long stroke style is applicable to the axial foot style and the rod side flange style.

For other applications that exceed the mounting support bracket and long stroke limitations, the maximum stroke that can be used is determined by the stroke selection table (reference edition).

Minimum Stroke for Auto Switch Mounting

(mm)

| Auto switch model | No. of auto switches mounted | | | | 1 |
|--------------------------------------|------------------------------|-----------|--|-------------------|----|
| | 2 | | n | | |
| | Different sides | Same side | Different sides | Same side | |
| D-C7□ D-C80 | 15 | 50 | $15 + 45 \left(\frac{n-2}{2} \right)$ (n = 2, 4, 6...) | 50 + 45 (n – 2) | 10 |
| D-H7□ D-H7□W D-H7BAL D-H7NF | 15 | 60 | | 60 + 45 (n – 2) | 10 |
| D-C73C D-C80C D-H7C | 15 | 65 | | 65 + 50 (n – 2) | 10 |
| D-B5□ D-B64 | 15 | 75 | | 75 + 55 (n – 2) | 10 |
| D-B59W | 20 | 75 | 15 | | |
| D-A3□A D-G39A D-K39A D-A44A | 35 | 100 | 35 + 30 (n – 2) | 100 + 100 (n – 2) | 10 |

Fine Lock Cylinder Double Acting, Single Rod Series CLM2

Mounting Bracket and Accessory

| Accessory Mounting | Standard equipment | | | Option | | | |
|------------------------------------|----------------------|-------------|------------|----------------------|-------------------------------------|-------------------------------------|----------|
| | Mounting nut | Rod end nut | Clevis pin | Single knuckle joint | Double ⁽³⁾ knuckle joint | Clevis ⁽⁴⁾ pivot bracket | Rod boot |
| Basic style | ● (1pc.) | ● | — | ● | ● | — | ● |
| Axial foot style | ● (2) | ● | — | ● | ● | — | ● |
| Rod side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Head side flange style | ● (1) | ● | — | ● | ● | — | ● |
| Clevis integrated style | — ⁽¹⁾ | ● | — | ● | ● | ● | ● |
| Single clevis style | — ⁽¹⁾ | ● | — | ● | ● | — | ● |
| Double clevis style ⁽³⁾ | — ⁽¹⁾ | ● | ● | ● | ● | — | ● |
| Head side trunnion style | ● (1) ⁽²⁾ | ● | — | ● | ● | — | ● |
| Boss-cut basic style | ● (1) | ● | — | ● | ● | — | ● |
| Boss-cut flange style | ● (1) | ● | — | ● | ● | — | ● |
| Note | | | | | With pin | With pin | |

Note 1) Mounting nut is not equipped with clevis integrated style, single clevis style and double clevis style.

Note 2) Trunnion nuts are attached for head side trunnion style.

Note 3) Pin and snap ring (ø40: cotter pin) are shipped together with double clevis and double knuckle joint.

Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

| Bore size (mm) | | 20 | 25 | 32 | 40 |
|--|---------------------------------|------|------|------|------|
| Basic weight | Basic style | 0.55 | 0.87 | 0.94 | 1.30 |
| | Axial foot style | 0.70 | 1.03 | 1.10 | 1.57 |
| | Flange style | 0.61 | 0.96 | 1.03 | 1.42 |
| | Clevis integrated style | 0.53 | 0.85 | 0.93 | 1.26 |
| | Single clevis style | 0.59 | 0.91 | 0.98 | 1.39 |
| | Double clevis style | 0.60 | 0.93 | 0.99 | 1.43 |
| | Trunnion style | 0.59 | 0.94 | 1.00 | 1.40 |
| | Boss-cut basic style | 0.54 | 0.85 | 0.92 | 1.27 |
| | Boss-cut flange style | 0.60 | 0.94 | 1.01 | 1.39 |
| Additional weight per each 50 mm of stroke | | 0.04 | 0.06 | 0.08 | 0.13 |
| Option bracket | Clevis bracket (With pin) | 0.07 | 0.07 | 0.14 | 0.14 |
| | Single knuckle joint | 0.06 | 0.06 | 0.06 | 0.23 |
| | Double knuckle joint (With pin) | 0.07 | 0.07 | 0.07 | 0.20 |

Calculation: (Example) CLM2L32-100

- Basic weight..... 1.10 (Foot, ø32)
- Additional weight 0.08/50 stroke
- Cylinder stroke..... 100 stroke
- $1.10 + 0.08 \times 100/50 = 1.26$ kg

Auto Switch Mounting Bracket Part No.

| Auto switch model | Bore size (mm) | | | |
|---------------------------|----------------|---------|---------|---------|
| | 20 | 25 | 32 | 40 |
| D-C7□/C80 D-H7□ | BM2-020 | BM2-025 | BM2-032 | BM2-040 |
| D-B5□/B64 D-G5□ | BA2-020 | BA2-025 | BA2-032 | BA2-040 |
| D-A3□/A44A D-G39A/K39A | BM3-020 | BM3-025 | BM3-032 | BM3-040 |

[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

BBA3: For D-B5/B6/G5

BBA4: For D-C7/C8/H7

"D-H7BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently, "BBA4" screws are attached.

Mounting Bracket Part No.

| Bore size (mm) | 20 | 25 | 32 | 40 |
|---------------------|----------|----------|----------|----|
| Axial foot * | CM-L020B | CM-L032B | CM-L040B | |
| Flange | CM-F020B | CM-F032B | CM-F040B | |
| Single clevis | CM-C020B | CM-C032B | CM-C040B | |
| Double clevis ** | CM-D020B | CM-D032B | CM-D040B | |
| Trunnion (with nut) | CM-T020B | CM-T032B | CM-T040B | |

* When ordering foot bracket, order 2 pieces per cylinder.

** Clevis pin and snap ring (ø40: cotter pin) are shipped together with double clevis style.

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the full length dimension (Versus standard type) (mm)

| ø20 | ø25 | ø32 | ø40 |
|-----|-----|-----|-----|
| ▲13 | ▲13 | ▲13 | ▲16 |

Mounting style

■ Boss-cut basic style (BZ) ■ Boss-cut flange style (FZ)

Air-hydro

CLM2H Mounting style Bore size Stroke Rod boot

↓ Air-hydro

Low hydraulic cylinder 1 MPa or less

Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.



Specifications

| | |
|----------------------------|---|
| Fluid | Turbine oil (Lock portion is air) |
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Maximum operating pressure | 1.0 MPa |
| Minimum operating pressure | 0.2 MPa |
| Piston speed | 15 to 300 mm/s |
| Cushion | Rubber bumper (Standard equipment) |
| Piping | Screw-in type |
| Mounting | Basic style, Axial foot style, Rod side flange style Head side flange style, Single clevis style Double clevis style, Head side trunnion style Clevis integrated style, Boss-cut style |

* Auto switch capable

• For an exterior dimension diagram to identify the mounting support types, refer to pages 9-2-22 to 9-2-26 as the dimensions are identical to those of standard.

Series CLM2

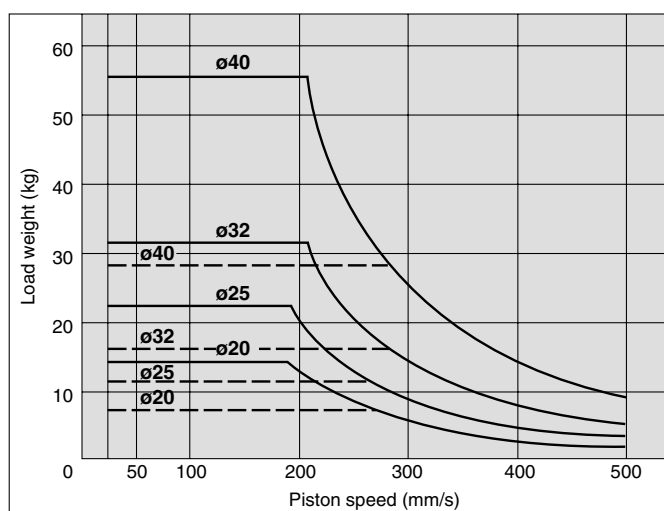
⚠ Caution/Allowable Kinetic Energy when Locking

| Bore size (mm) | 20 | 25 | 32 | 40 |
|------------------------------|------|------|------|------|
| Allowable kinetic energy (J) | 0.26 | 0.42 | 0.67 | 1.19 |

- In terms of specific load conditions, the allowable kinetic energy indicated in the table above is equivalent to a 50% load ratio at 0.5 MPa, and a piston speed of 300 mm/sec. Therefore, if the operating conditions are below these values, calculations are unnecessary.
- Apply the following formula to obtain the kinetic energy of the load.

$$E_k = \frac{1}{2}mv^2$$

E_k : Kinetic energy of load (J)
 m : Load weight (kg)
 v : Piston speed (m/s)
- The piston speed will exceed the average speed immediately before locking. To determine the piston speed for the purpose of obtaining the kinetic energy of load, use 1.2 times the average speed as a guide.
- The relation between the speed and the load of the respective tube bores is indicated in the diagram below. Use the cylinder in the range below the line.
- During locking, the lock mechanism must sustain the thrust of the cylinder itself, in addition to absorbing the energy of the load. Therefore, even within a given allowable kinetic energy level, there is an upper limit to the size of the load that can be sustained. Thus, a horizontally mounted cylinder must be operated below the solid line, and a vertically mounted cylinder must be operated below the dotted line.



Stopping Accuracy (Not including tolerance of control system.) (mm)

| Locking method | Piston speed (mm/s) | | | | |
|--------------------------------------|---------------------|------|------|------|------|
| | 20 * | 50 | 100 | 300 | 500 |
| Spring locking (Exhaust locking) | ±0.3 | ±0.4 | 0.5 | ±1.0 | ±2.0 |
| Pneumatic locking (Pressure locking) | ±0.15 | ±0.2 | ±0.3 | 0.5 | ±1.5 |
| Spring and pneumatic locking | | | | | |

Conditions: Load: 25% of thrust force at 0.5 MPa

Solenoid valve: Mounted to the lock port

20 mm/s marked with the asterisk is in the case of actuating hydraulically by means of air-hydro type.

⚠ Caution

Recommended Pneumatic Circuit/Caution on Handling

For detailed specifications of the fine lock cylinder, Series CLM2 mentioned above, refer to pages 9-2-4 to 9-2-7.

Accessory

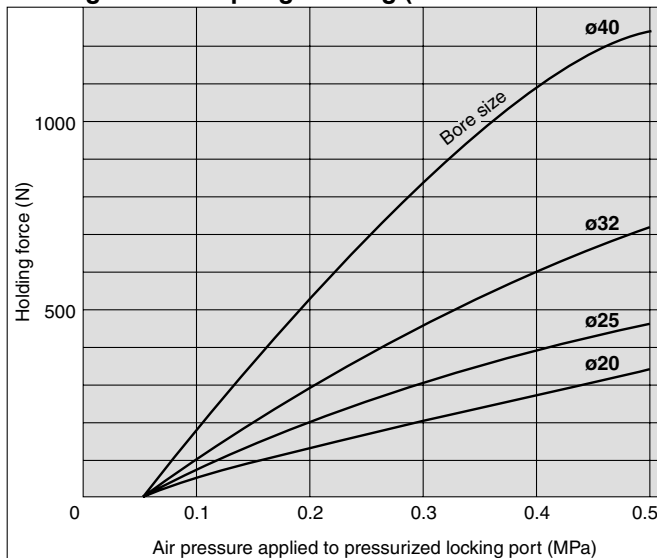
For accessory dimensions, refer to Best Pneumatics Vol. 6, since it is same as Series CM2.

Holding Force of Spring Locking (Maximum static load)

| Bore size (mm) | 20 | 25 | 32 | 40 |
|-------------------|-----|-----|-----|-----|
| Holding force (N) | 196 | 313 | 443 | 784 |

Note) Holding force at piston rod extended side decreases approximately 15%.

Holding Force of Spring Locking (Maximum static load)



⚠ Caution

Caution when Locking

The holding force is the lock's ability to hold a static load that does not involve vibrations or impacts, when it is locked without a load. Therefore, when normally using the cylinder near the upper limit of the holding force, be aware of the points described below.

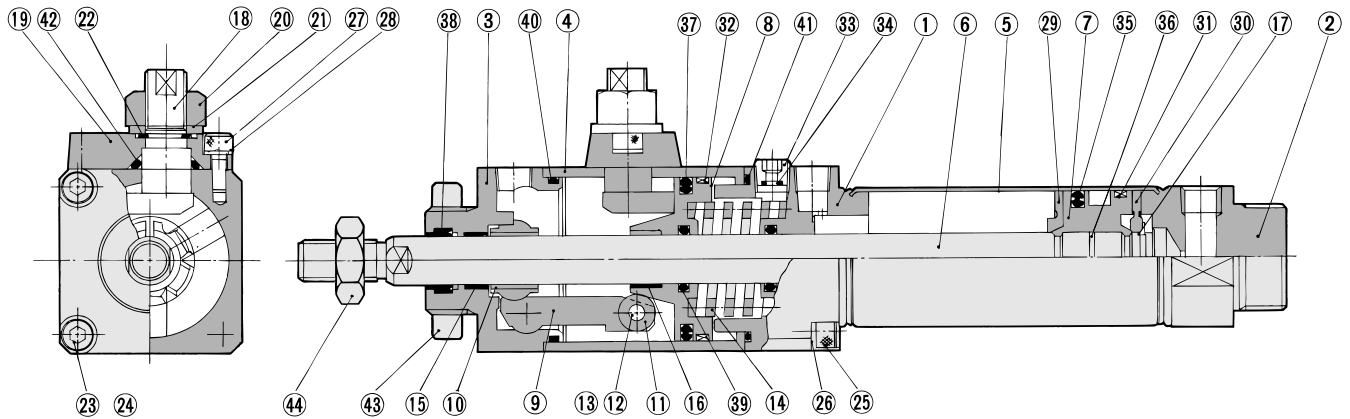
- If the piston rod slips because the lock's holding force has been exceeded, the brake shoe could be damaged, resulting in a reduced holding force or shortened life.
- Do not use the cylinder in the locked state to sustain a load that involves impact.
- To use the lock for drop prevention purposes, the load to be attached to the cylinder must be within 35% of the cylinder's holding force.

Regarding the installation position and the mounting height of the auto switch, refer to page of Series CDM2 air cylinder (Double acting, Single rod), since the dimensions are the same.

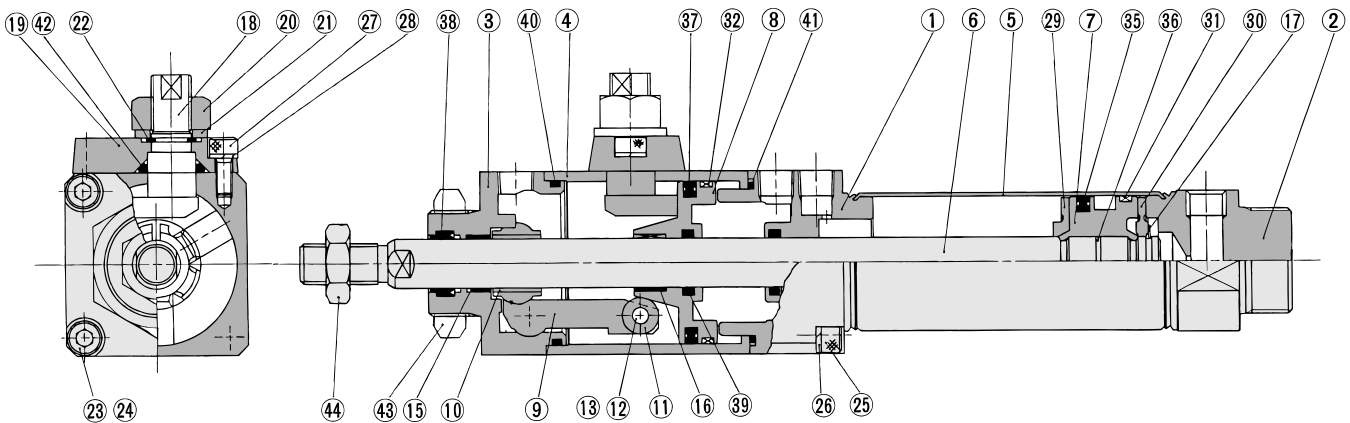
Fine Lock Cylinder Double Acting, Single Rod Series **CLM2**

Construction (Not able to disassemble.)

Spring locking (Exhaust locking)
Spring and pneumatic locking



Pneumatic locking (Pressure locking)



Component Parts

| No. | Description | Material | Note |
|-----|-------------------------------|--------------------------------|-------------------------|
| ① | Rod cover | Aluminum alloy | Clear anodized |
| ② | Head cover | Aluminum alloy | Clear anodized |
| ③ | Cover | Carbon steel | Nitrided, chrome plated |
| ④ | Intermediate cover | Aluminum alloy | Hard anodized |
| ⑤ | Cylinder tube | Stainless steel | |
| ⑥ | Piston rod | Carbon steel | Hard chrome plated |
| ⑦ | Piston | Aluminum alloy | Chromated |
| ⑧ | Brake piston | Carbon steel | Nitrided |
| ⑨ | Brake arm | Carbon steel | Nitrided |
| ⑩ | Brake shoe | Special friction material | |
| ⑪ | Roller | Carbon steel | |
| ⑫ | Pin | Carbon steel | |
| ⑬ | Snap ring | Carbon tool steel | Nickel plated |
| ⑭ | Brake spring | Spring steel wire | Dacrodized |
| ⑮ | Bushing | Oil-impregnated sintered alloy | |
| ⑯ | Bushing | Oil-impregnated sintered alloy | |
| ⑰ | Snap ring | Carbon tool steel | Nickel plated |
| ⑱ | Manual lock release cam | Chromium molybdenum steel | Nickel plated |
| ⑲ | Cam guide | Carbon steel | Nitrided, painted |
| ⑳ | Lock nut | Rolled steel | Nickel plated |
| ㉑ | Flat washer | Rolled steel | Nickel plated |
| ㉒ | Snap ring | Carbon tool steel | Nickel plated |
| ㉓ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |

| No. | Description | Material | Note |
|-----|-------------------------------|---------------------------|---------------|
| ㉔ | Spring washer | Steel wire | Nickel plated |
| ㉕ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |
| ㉖ | Spring washer | Steel wire | Nickel plated |
| ㉗ | Hexagon socket head cap screw | Chromium molybdenum steel | Nickel plated |
| ㉘ | Spring washer | Steel wire | Nickel plated |
| ㉙ | Bumper A | Urethane | |
| ㉚ | Bumper B | Urethane | |
| ㉛ | Wear ring | Resin | |
| ㉜ | Wear ring | Resin | |
| ㉝ | Hexagon socket head plug | Carbon steel | Type E only |
| ㉞ | Element | Bronze | Type E only |
| ㉟ | Piston seal | NBR | |
| ㊱ | Piston gasket | NBR | |
| ㊲ | Brake piston seal | NBR | |
| ㊳ | Rod seal A | NBR | |
| ㊴ | Rod seal B | NBR | |
| ㊵ | Middle cover gasket A | NBR | |
| ㊶ | Middle cover gasket B | NBR | |
| ㊷ | Cam gasket | NBR | |
| ㊸ | Mounting nut | Carbon steel | Nickel plated |
| ㊹ | Rod end nut | Carbon steel | Nickel plated |

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

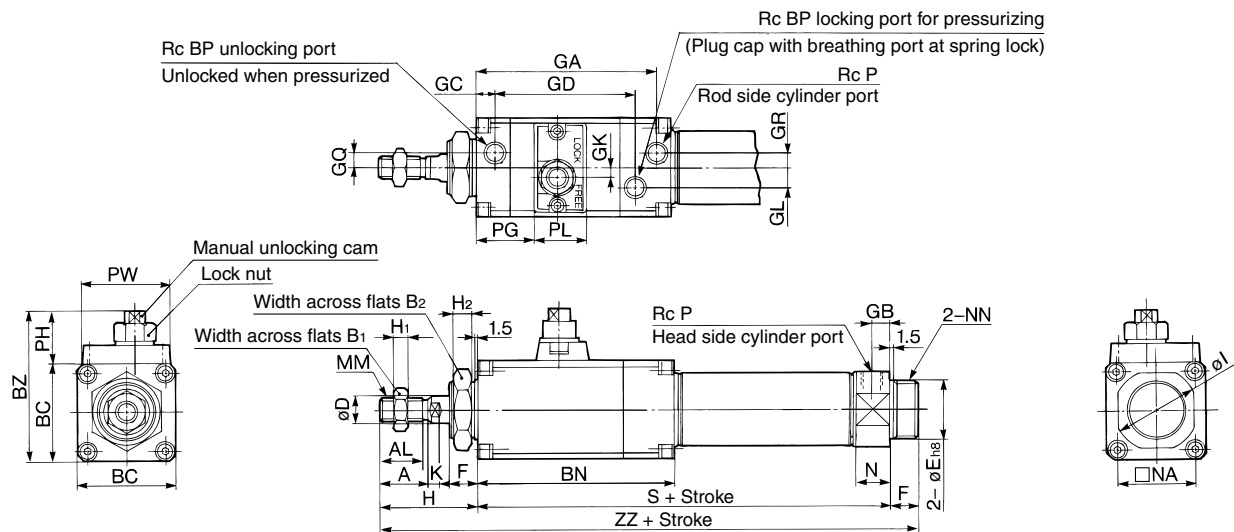
Data

Series CLM2

Basic Style (B)

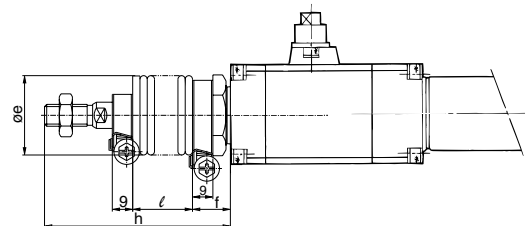
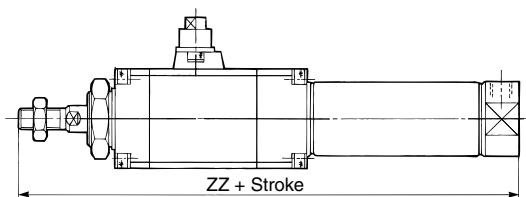
CLM2B

Basic style



Boss-cut

With rod boot



| Bore (mm) | Stroke range | A | AL | B ₁ | B ₂ | BC | BN | BP | BQ | BZ | D | E | F | GA | GB | GC | GD | GK | GL | GQ | GR | H | H ₁ | H ₂ | I |
|-----------|--------------|----|------|----------------|----------------|----|-------|-----|-----|------|----|-----------------------------------|----|------|----|----|------|-----|----|----|----|----|----------------|----------------|------|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 38 | 80 | 1/8 | 1/8 | 57.5 | 8 | 20 ⁰ _{-0.033} | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 | 4 | 4 | 41 | 5 | 8 | 28 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 10 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 | 33.5 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 12 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 | 37.5 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 52 | 100.5 | 1/8 | 1/8 | 76 | 14 | 32 ⁰ _{-0.039} | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 | 8 | 7 | 50 | 8 | 10 | 46.5 |

| Bore (mm) | K | MM | N | NA | NN | P | PG | PH | PL | PW | S | ZZ |
|-----------|-----|------------|------|------|-----------|-----|----|------|----|----|-----|-----|
| 20 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 127 | 181 |
| 25 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 137 | 195 |
| 32 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 139 | 197 |
| 40 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 167 | 233 |

Boss-cut

| Bore size (mm) | ZZ |
|----------------|-----|
| 20 | 168 |
| 25 | 182 |
| 32 | 184 |
| 40 | 217 |

With Rod Boot

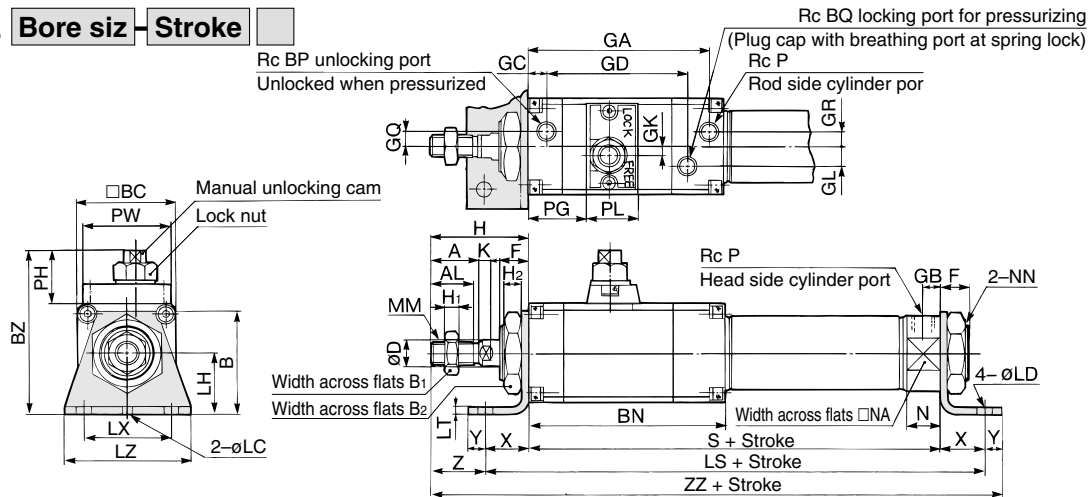
| Bore size (mm) | e | f | h | | | | | | | ℓ | | | | | | |
|----------------|----|----|---------|-----------|------------|------------|------------|------------|------------|---------|-----------|------------|------------|------------|------------|------------|
| | | | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 | 1 to 50 | 51 to 100 | 101 to 150 | 151 to 200 | 201 to 300 | 301 to 400 | 401 to 500 |
| 20 | 35 | 17 | 68 | 81 | 93 | 106 | 131 | 156 | — | 12.5 | 25 | 37.5 | 50 | 75 | 100 | — |
| 25 | 35 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |
| 32 | 35 | 17 | 72 | 85 | 97 | 110 | 135 | 160 | 185 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |
| 40 | 46 | 17 | 77 | 90 | 102 | 115 | 140 | 165 | 190 | 12.5 | 25 | 37.5 | 50 | 75 | 100 | 125 |

* Over 301 stroke: Long stroke.

Fine Lock Cylinder Double Acting, Single Rod Series **CLM2**

Axial Foot Style (L)

CLM2L Bore siz Stroke

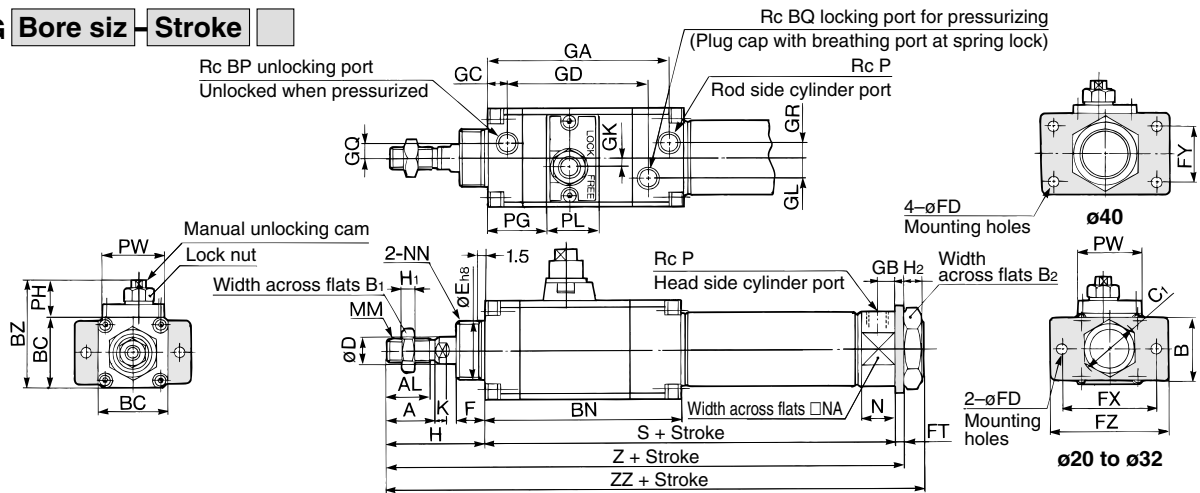


| Bore (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | BC | BN | BP | BQ | BZ | D | F | GA | GB | GC | GD | GK | GL | GQ | GR | H | H ₁ | H ₂ |
|-----------|--------------|----|------|----|----------------|----------------|----|-------|-----|-----|------|----|----|------|----|----|------|-----|----|----|----|----|----------------|----------------|
| 20 | Up to 400 | 18 | 15.5 | 40 | 13 | 26 | 38 | 80 | 1/8 | 1/8 | 63.5 | 8 | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 | 4 | 4 | 41 | 5 | 8 |
| 25 | Up to 450 | 22 | 19.5 | 47 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 74.5 | 10 | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 |
| 32 | Up to 450 | 22 | 19.5 | 47 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 74.5 | 12 | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 |
| 40 | Up to 500 | 24 | 21 | 54 | 22 | 41 | 52 | 100.5 | 1/8 | 1/8 | 80 | 14 | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 | 8 | 7 | 50 | 8 | 10 |

| Bore (mm) | K | LC | LD | LH | LS | LT | LX | LZ | MM | N | NA | NN | P | PG | PH | PL | PW | S | X | Y | Z | ZZ |
|-----------|-----|----|-----|----|-----|-----|----|----|------------|------|------|-----------|-----|----|------|----|----|-----|----|----|----|-----|
| 20 | 5 | 4 | 6.8 | 25 | 167 | 3.2 | 40 | 55 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 127 | 20 | 8 | 21 | 196 |
| 25 | 5.5 | 4 | 6.8 | 28 | 177 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 137 | 20 | 8 | 25 | 210 |
| 32 | 5.5 | 4 | 6.8 | 28 | 179 | 3.2 | 40 | 55 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 139 | 20 | 8 | 25 | 212 |
| 40 | 7 | 4 | 7 | 30 | 213 | 3.2 | 55 | 75 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 167 | 23 | 10 | 27 | 250 |

Head Side Flange Style (G)

CLM2G Bore siz Stroke



| Bore size (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | BC | BN | BP | BQ | BZ | C ₁ | D | E | F | FD | FT | FX | FY | FZ | GA | GB |
|----------------|--------------|----|------|----|----------------|----------------|----|-------|-----|-----|------|----------------|----|-----------------------------------|----|----|----|----|----|----|------|----|
| 20 | Up to 300 | 18 | 15.5 | 34 | 13 | 26 | 38 | 80 | 1/8 | 1/8 | 57.5 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 73.5 | 8 |
| 25 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 83.5 | 8 |
| 32 | Up to 300 | 22 | 19.5 | 40 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 83.5 | 8 |
| 40 | Up to 300 | 24 | 21 | 52 | 22 | 41 | 52 | 100.5 | 1/8 | 1/8 | 76 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 90.5 | 11 |

| Bore size (mm) | GC | GD | GK | GL | GQ | GR | H | H ₁ | H ₂ | K | MM | N | NA | NN | P | PG | PH | PL | PW | S | Z | ZZ |
|----------------|----|------|-----|----|----|----|----|----------------|----------------|-----|------------|------|------|-----------|-----|----|------|----|----|-----|-----|-----|
| 20 | 8 | 55 | 3.5 | 6 | 4 | 4 | 41 | 5 | 8 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 127 | 172 | 181 |
| 25 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 137 | 186 | 195 |
| 32 | 9 | 64.5 | 4 | 9 | 7 | 7 | 45 | 6 | 8 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 139 | 188 | 197 |
| 40 | 8 | 70 | 4 | 11 | 8 | 7 | 50 | 8 | 10 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 167 | 222 | 233 |

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

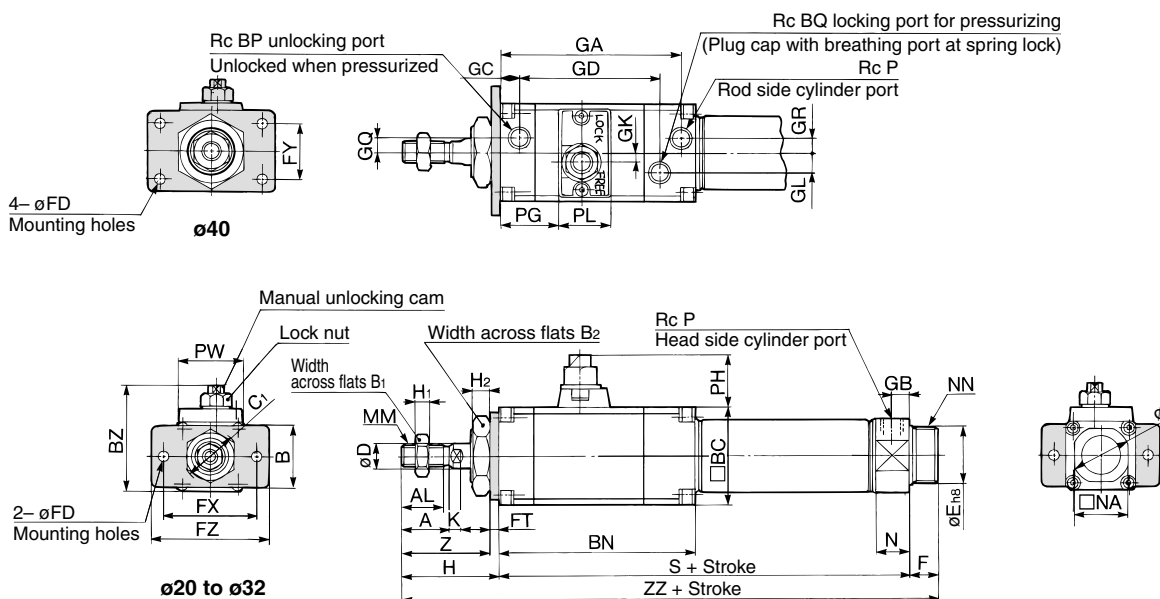
20-

Data

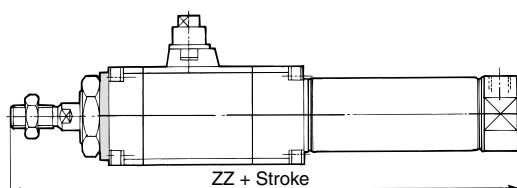
Series CLM2

Rod Side Flange Style (F)

CLM2F Bore size — Stroke



Boss-cut



| Bore (mm) | Stroke range | A | AL | B | B ₁ | B ₂ | BC | BN | BP | BQ | BZ | C ₁ | D | E | F | FD | FT | FX | FY | FZ | GA | GB | GC | GD | GK |
|-----------|--------------|----|------|----|----------------|----------------|----|-------|-----|-----|------|----------------|----|-----------------------------------|----|----|----|----|----|----|------|----|----|------|-----|
| 20 | Up to 400 | 18 | 15.5 | 34 | 13 | 26 | 38 | 80 | 1/8 | 1/8 | 57.5 | 30 | 8 | 20 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 73.5 | 8 | 8 | 55 | 3.5 |
| 25 | Up to 450 | 22 | 19.5 | 40 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 37 | 10 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 83.5 | 8 | 9 | 64.5 | 4 |
| 32 | Up to 450 | 22 | 19.5 | 40 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 37 | 12 | 26 ⁰ _{-0.033} | 13 | 7 | 4 | 60 | — | 75 | 83.5 | 8 | 9 | 64.5 | 4 |
| 40 | Up to 500 | 24 | 21 | 52 | 22 | 41 | 52 | 100.5 | 1/8 | 1/8 | 76 | 47.3 | 14 | 32 ⁰ _{-0.039} | 16 | 7 | 5 | 66 | 36 | 82 | 90.5 | 11 | 8 | 70 | 4 |

| Bore (mm) | GL | GQ | GR | H | H ₁ | H ₂ | I | K | MM | N | NA | NN | P | PG | PH | PL | PW | S | Z | ZZ |
|-----------|----|----|----|----|----------------|----------------|------|-----|------------|------|------|-----------|-----|----|------|----|----|-----|----|-----|
| 20 | 6 | 4 | 4 | 41 | 5 | 8 | 28 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 127 | 37 | 181 |
| 25 | 9 | 7 | 7 | 45 | 6 | 8 | 33.5 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 137 | 41 | 195 |
| 32 | 9 | 7 | 7 | 45 | 6 | 8 | 37.5 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 139 | 41 | 197 |
| 40 | 11 | 8 | 7 | 50 | 8 | 10 | 46.5 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 167 | 45 | 233 |

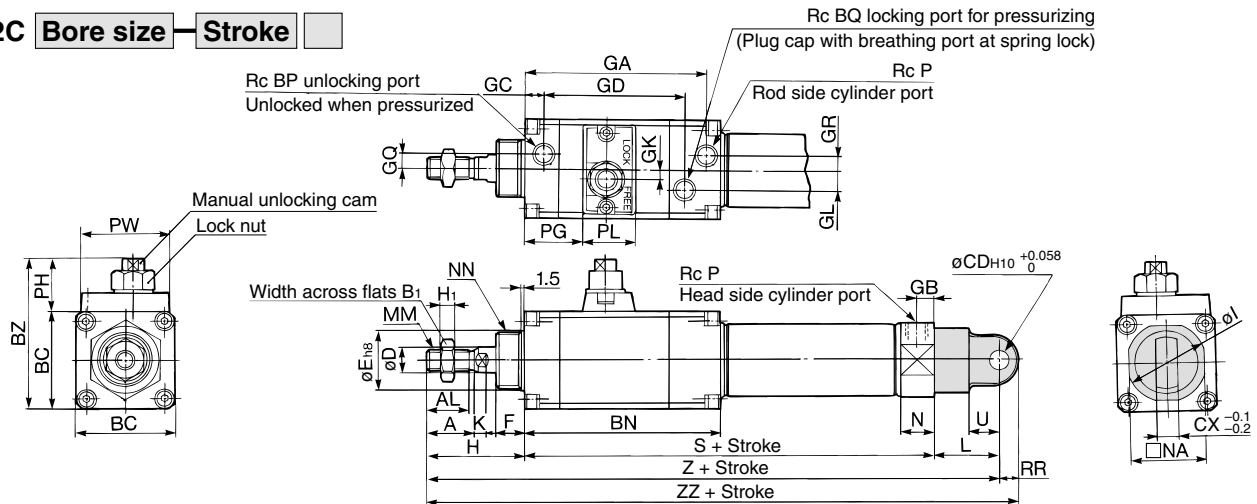
Boss-cut

| Bore (mm) | ZZ |
|-----------|-----|
| 20 | 168 |
| 25 | 182 |
| 32 | 184 |
| 40 | 217 |

Fine Lock Cylinder Double Acting, Single Rod Series **CLM2**

Single Clevis Style (C)

CLM2C Bore size Stroke

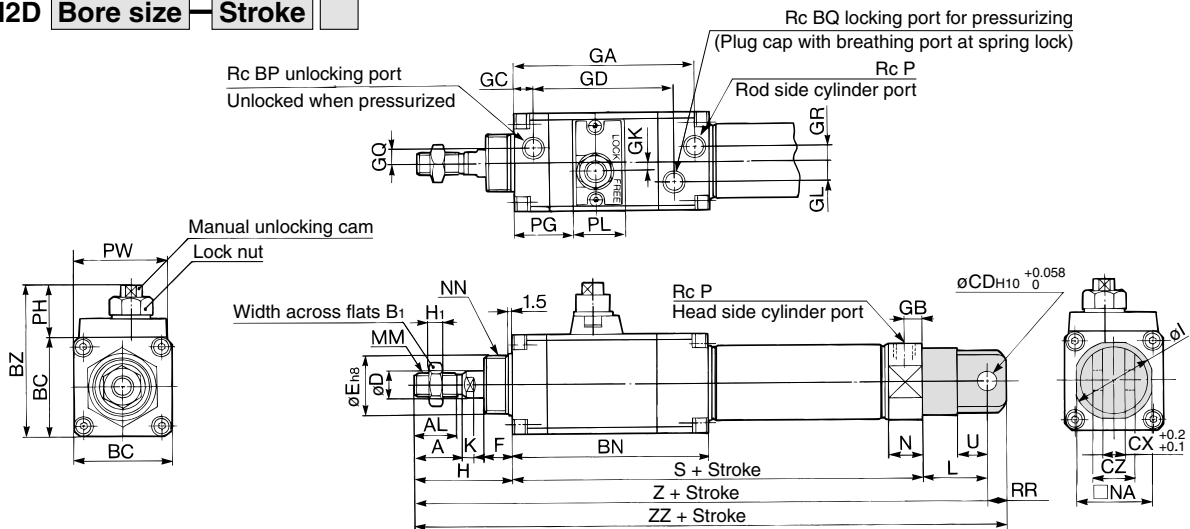


| Bore size (mm) | Stroke range | A | AL | B ₁ | BC | BN | BP | BQ | BZ | CD | CX | D | E | F | GA | GB | GC | GD | GK | GL | GQ |
|----------------|--------------|----|------|----------------|----|-------|-----|-----|------|----|----|----|-----------------------------------|----|------|----|----|------|-----|----|----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 38 | 80 | 1/8 | 1/8 | 57.5 | 9 | 10 | 8 | 20 ⁰ _{-0.033} | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 | 4 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 9 | 10 | 10 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 9 | 10 | 12 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 40 | Up to 300 | 24 | 21 | 22 | 52 | 100.5 | 1/8 | 1/8 | 76 | 10 | 15 | 14 | 32 ⁰ _{-0.039} | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 | 8 |

| Bore size (mm) | GR | H | H ₁ | I | K | L | MM | N | NA | NN | P | PG | PH | PL | PW | RR | S | U | Z | ZZ |
|----------------|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|------|----|----|----|-----|----|-----|-----|
| 20 | 4 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 9 | 127 | 14 | 198 | 207 |
| 25 | 7 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 9 | 137 | 14 | 212 | 221 |
| 32 | 7 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 9 | 139 | 14 | 214 | 223 |
| 40 | 7 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 11 | 167 | 18 | 256 | 267 |

Double Clevis Style (D)

CLM2D Bore size Stroke



| Bore size (mm) | Stroke range | A | AL | B ₁ | BC | BN | BP | BQ | BZ | CD | CX | CZ | D | E | F | GA | GB | GC | GD | GK | GL |
|----------------|--------------|----|------|----------------|----|-------|-----|-----|------|----|----|----|----|-----------------------------------|----|------|----|----|------|-----|----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 38 | 80 | 1/8 | 1/8 | 57.5 | 9 | 10 | 19 | 8 | 20 ⁰ _{-0.033} | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 9 | 10 | 19 | 10 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 9 | 10 | 19 | 12 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 |
| 40 | Up to 300 | 24 | 21 | 22 | 52 | 100.5 | 1/8 | 1/8 | 76 | 10 | 15 | 30 | 14 | 32 ⁰ _{-0.039} | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 |

| Bore size (mm) | GQ | GR | H | H ₁ | I | K | L | MM | N | NA | NN | P | PG | PH | PL | PW | RR | S | U | Z | ZZ |
|----------------|----|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|------|----|----|----|-----|----|-----|-----|
| 20 | 4 | 4 | 41 | 5 | 28 | 5 | 30 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 9 | 127 | 14 | 198 | 207 |
| 25 | 7 | 7 | 45 | 6 | 33.5 | 5.5 | 30 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 9 | 137 | 14 | 212 | 221 |
| 32 | 7 | 7 | 45 | 6 | 37.5 | 5.5 | 30 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 9 | 139 | 14 | 214 | 223 |
| 40 | 8 | 7 | 50 | 8 | 46.5 | 7 | 39 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 11 | 167 | 18 | 256 | 267 |

* Clevis pin and snap ring (ø40: cotter pin) are shipped together.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

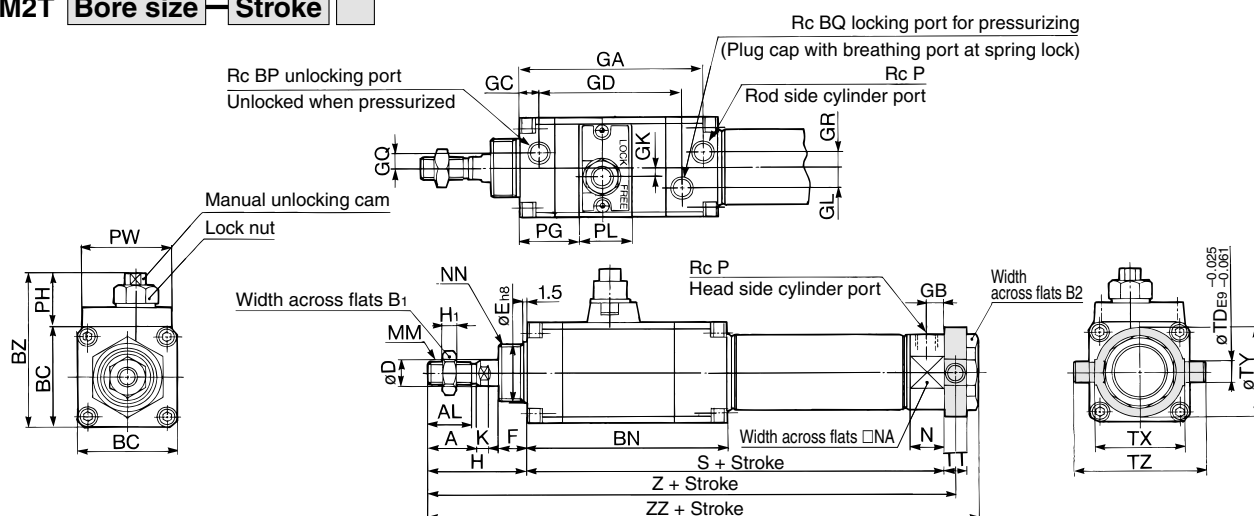
20-

Data

Series CLM2

Head Side Trunnion Style (T)

CLM2T Bore size — Stroke

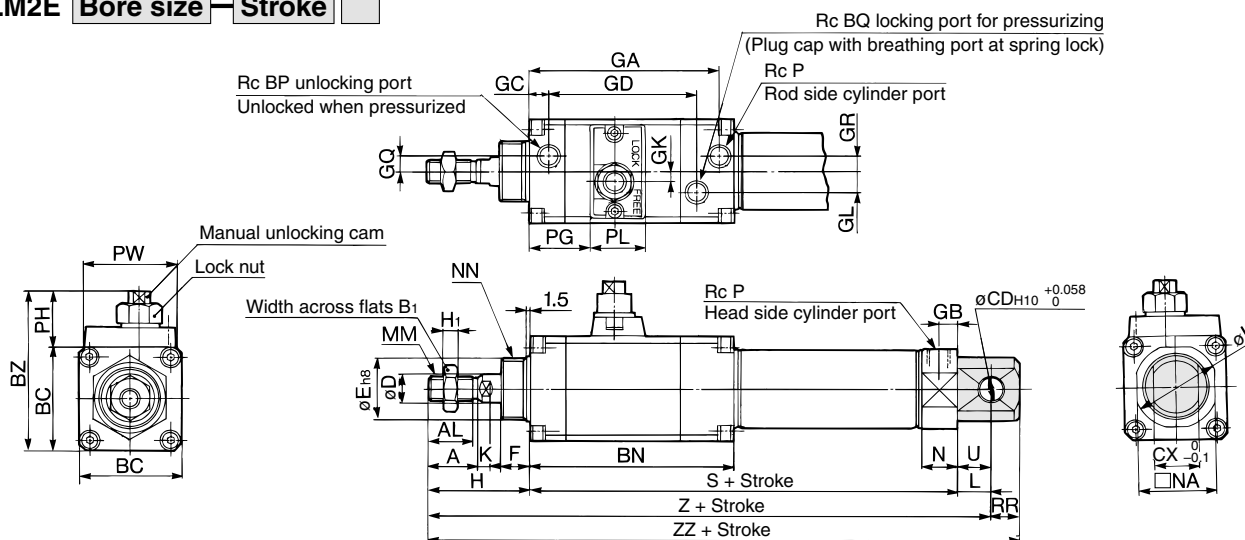


| Bore size (mm) | Stroke range | A | AL | B ₁ | B ₂ | BC | BN | BP | BQ | BZ | D | E | F | GA | GB | GC | GD | GK | GL | GQ |
|----------------|--------------|----|------|----------------|----------------|----|-------|-----|-----|------|----|-----------------------------------|----|------|----|----|------|-----|----|----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 26 | 38 | 80 | 1/8 | 1/8 | 57.5 | 8 | 20 ⁰ _{-0.033} | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 | 4 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 10 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 32 | 45 | 90 | 1/8 | 1/8 | 69 | 12 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 40 | Up to 300 | 24 | 21 | 22 | 41 | 52 | 100.5 | 1/8 | 1/8 | 76 | 14 | 32 ⁰ _{-0.039} | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 | 8 |

| Bore size (mm) | GR | H | H ₁ | K | MM | N | NA | NN | P | PG | PH | PL | PW | S | TD | TT | TX | TY | TZ | Z | ZZ |
|----------------|----|----|----------------|-----|------------|------|------|-----------|-----|----|------|----|----|-----|----|----|----|----|----|-------|-----|
| 20 | 4 | 41 | 5 | 5 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 127 | 8 | 10 | 32 | 32 | 52 | 173 | 183 |
| 25 | 7 | 45 | 6 | 5.5 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 137 | 9 | 10 | 40 | 40 | 60 | 187 | 197 |
| 32 | 7 | 45 | 6 | 5.5 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 139 | 9 | 10 | 40 | 40 | 60 | 189 | 199 |
| 40 | 7 | 50 | 8 | 7 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 167 | 10 | 11 | 53 | 53 | 77 | 222.5 | 233 |

Clevis Integrated Style (E)

CLM2E Bore size — Stroke



| Bore size (mm) | Stroke range | A | AL | B ₁ | BC | BN | BP | BQ | BZ | CD | CX | D | E | F | GA | GB | GC | GD | GK | GL | GQ |
|----------------|--------------|----|------|----------------|----|-------|-----|-----|------|----|----|----|-----------------------------------|----|------|----|----|------|-----|----|----|
| 20 | Up to 300 | 18 | 15.5 | 13 | 38 | 80 | 1/8 | 1/8 | 57.5 | 8 | 12 | 8 | 20 ⁰ _{-0.033} | 13 | 73.5 | 8 | 8 | 55 | 3.5 | 6 | 4 |
| 25 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 8 | 12 | 10 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 32 | Up to 300 | 22 | 19.5 | 17 | 45 | 90 | 1/8 | 1/8 | 69 | 10 | 20 | 12 | 26 ⁰ _{-0.033} | 13 | 83.5 | 8 | 9 | 64.5 | 4 | 9 | 7 |
| 40 | Up to 300 | 24 | 21 | 22 | 52 | 100.5 | 1/8 | 1/8 | 76 | 10 | 20 | 14 | 32 ⁰ _{-0.039} | 16 | 90.5 | 11 | 8 | 70 | 4 | 11 | 8 |

| Bore size (mm) | GR | H | H ₁ | I | K | L | MM | N | NA | NN | P | PG | PH | PL | PW | RR | S | U | Z | ZZ |
|----------------|----|----|----------------|------|-----|----|------------|------|------|-----------|-----|----|------|----|----|----|-----|------|-----|-----|
| 20 | 4 | 41 | 5 | 28 | 5 | 12 | M8 x 1.25 | 15 | 24 | M20 x 1.5 | 1/8 | 22 | 19.5 | 20 | 38 | 9 | 127 | 11.5 | 180 | 189 |
| 25 | 7 | 45 | 6 | 33.5 | 5.5 | 12 | M10 x 1.25 | 15 | 30 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 9 | 137 | 11.5 | 194 | 203 |
| 32 | 7 | 45 | 6 | 37.5 | 5.5 | 15 | M10 x 1.25 | 15 | 34.5 | M26 x 1.5 | 1/8 | 27 | 24 | 24 | 41 | 12 | 139 | 14.5 | 199 | 211 |
| 40 | 7 | 50 | 8 | 46.5 | 7 | 15 | M14 x 1.5 | 21.5 | 42.5 | M32 x 2 | 1/4 | 29 | 24 | 24 | 41 | 12 | 167 | 14.5 | 232 | 244 |

Pin Cylinders

2 auto switches can even be mounted on a cylinder with $\varnothing 4$ bore size (5 mm stroke).



Double acting / **Series CJP2**

One-touch fitting can be connected.
(Panel mount type)

$\varnothing 2$ one-touch fitting, miniature fitting, and speed controller can be connected.



Single acting / **Series CJP**



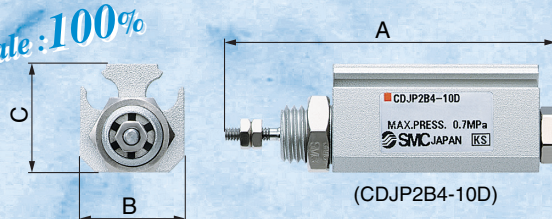
Series CJP2/CJP

Small and Light

Double acting / **Series CJP2**

- Full length: Shortened by 6 to 9.5 mm **Scale: 100%**
- Weight: Reduced by 55 to 65%

New aluminum body is light weight compared with the conventional CJP series.
(Compared with the basic model CJP cylinder without auto switch)



Dimensions

Unit: mm

| Bore size | A | B | C |
|-----------|----------------------------------|----|------|
| 4 | 29 + stroke (34 + stroke) | 14 | 14.5 |
| 6 | 33 + stroke (38 + stroke) | 14 | 16.5 |
| 10 | 39.5 + stroke (44.5 + stroke) | 15 | 19 |
| 16 | 43.5 + stroke (48.5 + stroke) | 20 | 24.5 |

* (): Dimension for built-in magnet type

Weight

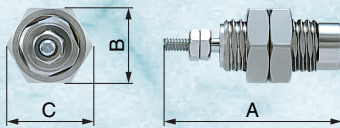
Unit: g

| Stroke | Bore size (mm) | | | |
|--------|----------------|----|----|----|
| | 4 | 6 | 10 | 16 |
| 5 | 11 | 16 | 27 | 42 |
| 10 | 13 | 18 | 29 | 46 |
| 15 | 15 | 21 | 32 | 50 |
| 20 | 17 | 23 | 35 | 54 |
| 25 | — | 25 | 37 | 58 |
| 30 | — | — | 40 | 63 |
| 35 | — | — | 43 | 67 |
| 40 | — | — | 45 | 71 |

Single acting / **Series CJP**

Panel mount type (CJPB4-5)

Scale: 100%



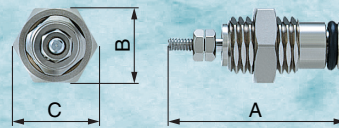
Dimensions

Unit: g

| Bore size | A | | | B | C |
|-----------|------|-------|-------|----|------|
| | 5 st | 10 st | 15 st | | |
| 4 | 23.5 | 31.5 | 39.5 | 10 | 11.5 |
| 6 | 27.5 | 34.5 | 41.5 | 12 | 13.9 |
| 10 | 32.5 | 39 | 46 | 19 | 22 |
| 15 | 37.5 | 43.5 | 50 | 27 | 31 |

Embedded type (CJPS4-5)

Scale: 100%



Weight

Unit: g

| Stroke (mm) | Bore size (mm) | | | |
|-------------|----------------|------|----|----|
| | 4 | 6 | 10 | 15 |
| 5 | 10 | 10.6 | 28 | 75 |
| 10 | 13 | 13.1 | 33 | 82 |
| 15 | 15 | 15.6 | 38 | 92 |

Variation

| Series | Action | Bore size (mm) | Standard stroke (mm) | Mounting ^{Note 2)} |
|-------------|---------------------------|----------------|-----------------------------------|---|
| CJP2 | Double acting, Single rod | 4 | 5, 10, 15 (20) ^{Note 1)} | Basic Flange Foot Clevis Trunnion |
| | | 6 | 5, 10, 15, 20, 25 | |
| | | 10 | 5, 10, 15, 20, 25, 30, 35, 40 | |
| | | 16 | 5, 10, 15, 20, 25, 30, 35, 40 | |

| Series | Action | Bore size (mm) | Standard stroke (mm) | Mounting |
|------------|------------------------------|----------------|----------------------|---------------------------------|
| CJP | Single acting, spring return | 4 | 5, 10, 15 | Panel mount type, Embedded type |
| | | 6 | 5, 10, 15 | |
| | | 10 | 5, 10, 15 | |
| | | 15 | 5, 10, 15 | |

Note 1) A stroke of 20 is available with a standard product only. Note 2) Bore size of ø4 is available with basic mounting only.

Related Products



Pin Cylinder: Double Acting, Single Rod

Series CJP2

ø4, ø6, ø10, ø16

How to Order

Standard CJP2 **F** **10** - **15** **D** - **□** - **□**

Built-in magnet CDJP2 **F** **10** - **15** **D** - **□** - **M9B** **S** - **□**

With auto switch
(Built-in magnet)

Mounting

| Symbol | Mounting | Standard | Built-in magnet |
|----------|----------|----------|-----------------|
| B | Basic | ● | ● |
| F | Flange | ● | ● |
| L | Foot | ● | ● |
| D | Clevis | ● | ● |
| T | Trunnion | ● | ● |

* Bore size of 4 mm is available with basic mounting only.
* Mounting bracket is shipped together (but not assembled).

Bore size

| Symbol | Bore size |
|-----------|-----------|
| 4 | 4 mm |
| 6 | 6 mm |
| 10 | 10 mm |
| 16 | 16 mm |

Cylinder standard stroke (mm)

| Stroke | Standard stroke (mm) |
|----------|-------------------------------------|
| ø4 | 5, 10, 15, (20) <small>Note</small> |
| ø6 | 5, 10, 15, 20, 25 |
| ø10, ø16 | 5, 10, 15, 20, 25, 30, 35, 40 |

Note) A stroke of 20 is available with a standard product only.

Double acting

Number of auto switches

| Symbol | Number of auto switches |
|------------|-------------------------|
| Nil | 2 pcs. |
| S | 1 pc. |

Auto switch

| Symbol | Auto switch |
|------------|---------------------------------------|
| Nil | Without auto switch (Built-in magnet) |

* For the applicable auto switch model, refer to the below table.
* Auto switches are shipped together, (but not assembled).

Rod end thread

| Symbol | Rod end thread |
|------------|----------------|
| Nil | With thread |
| B | Without thread |

Made to Order
(Refer to page 2.)

Applicable Auto Switches / For detailed auto switch specifications, refer to page 17 through to 21.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | | Auto switch model | | Lead wire length (m)* | | | | Pre-wired connector | Applicable load | |
|--------------------|------------------|------------------|-----------------|---------------------|--------------|-----------|----------------------------|-------------------|-----------|-----------------------|-------|-------|---|---------------------|-----------------|------------|
| | | | | | DC | AC | Electrical entry direction | | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | | | |
| | | | | | | | Perpendicular | In-line | | | | | | | | |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equiv.) | — | 5 V | — | A96V** | A96** | ● | — | ● | — | — | IC circuit | — |
| | | | — | 2-wire | 24 V | 12 V | 100 V | A93V** | A93** | ● | — | ● | — | — | — | Relay, PLC |
| | | | | | | 5 V, 12 V | 100 V or less | A90V** | A90** | ● | — | ● | — | — | IC circuit | — |
| Solid state switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | ● | — | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | M9PV | | M9P | ● | — | ● | ○ | ○ | — | | |
| | 2-wire | | | 12 V | | M9BV | | M9B | ● | — | ● | ○ | ○ | — | | |
| | 3-wire (NPN) | | | 5 V, 12 V | | M9NWV | | M9NW | ● | ● | ● | ○ | ○ | IC circuit | | |
| | 3-wire (PNP) | | | M9PWV | | M9PW | | ● | ● | ● | ○ | ○ | — | | | |
| | 2-wire | | | 12 V | | M9BWV | | M9BW | ● | ● | ● | ○ | ○ | — | | |

* Lead wire length symbols: 0.5 m Nil (Example) M9N
1 m M M9NWM
3 m L M9NL
5 m Z M9NZ

** The D-A9□(V) switch is not attachable to ø4.

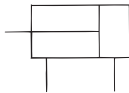
* Auto switches marked with "○" are made to order specification.
* For details about auto switches with pre-wired connector, refer to "Best Pneumatics 2004" Vol. 6 catalog.
* Auto switches are shipped together, (but not assembled).

Series CJP2



JIS Symbol

Double acting, Single rod



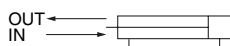
Made to Order

(For details, refer to page 22, 23.)

| Symbol | Specifications |
|-------------|--------------------------------|
| XA □ | Change of rod end style |
| XB6 | Heat resistant cylinder (150C) |
| XB7 | Cold resistant cylinder |
| XC22 | Fluoro rubber seals |

Theoretical Output

| Bore size (mm) | Operating direction | Operating pressure (MPa) | | |
|----------------|---------------------|--------------------------|-------|-------|
| | | 0.3 | 0.5 | 0.7 |
| 4 | IN | 2.8 | 4.7 | 6.6 |
| | OUT | 3.8 | 6.3 | 8.8 |
| 6 | IN | 6.4 | 10.6 | 14.8 |
| | OUT | 8.5 | 14.1 | 19.8 |
| 10 | IN | 19.8 | 33 | 46.2 |
| | OUT | 23.6 | 39.3 | 55 |
| 16 | IN | 51.8 | 86.4 | 121 |
| | OUT | 60.3 | 100.5 | 140.7 |



Specifications

| | | |
|--------------------------------------|---|----------|
| Action | Double acting, Single rod | |
| Maximum operating pressure | 0.7 MPa | |
| Minimum operating pressure | ø4 | 0.15 MPa |
| | ø6 | 0.12 MPa |
| | ø10, ø16 | 0.06 MPa |
| Proof pressure | 1.05 MPa | |
| Ambient and fluid temperature | Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing) | |
| Lubrication | Not required (Non-lube) | |
| Stroke length tolerance | +1.0 0 | |
| Thread tolerance | JIS Class 2 | |
| Rod end style | With thread/Without thread | |
| Piston speed | 50 to 500 mm/s | |
| Cushion | Rubber bumper | |
| Mounting <small>Note)</small> | Basic, Flange, Foot, Clevis, Trunnion | |

Note) Bore size of ø4 is available with basic mounting only.

Standard Equipment Accessory

| Accessory | Mounting nut (1 pc.) | Rod end nut (2 pcs.) (with thread) | Trunnion (with pin) |
|-----------|----------------------|------------------------------------|---------------------|
| Mounting | | | |
| Basic | ● | ● | — |
| Flange | ● | ● | — |
| Foot | ● | ● | — |
| Clevis | — | ● | — |
| Trunnion | — | ● | ● |

Standard Stroke

| Bore size (mm) | Stroke (mm) |
|----------------|------------------------------------|
| 4 | 5, 10, 15, 20 <small>Note)</small> |
| 6 | 5, 10, 15, 20, 25 |
| 10 | 5, 10, 15, 20, 25, 30, 35, 40 |
| 16 | 5, 10, 15, 20, 25, 30, 35, 40 |

* 20 stroke of bore size 4 mm is standard type only.

Option

| Bore size (mm) | 6 | 10 | 16 |
|---------------------------------|-------------------------------|---------|---------|
| Description | | | |
| Auto switch | D-A9□(V), D-M9□(V), D-M9□W(V) | | |
| Single knuckle joint | I-P006A | I-P010A | I-P016A |
| Double knuckle joint (with pin) | Y-P006A | Y-P010A | Y-P016A |

Mounting Bracket Part No.

| Bore size (mm) | 6 | 10 | 16 |
|---------------------|----------|----------|----------|
| Bracket | | | |
| Flange | CP-F006A | CP-F010A | CP-F016A |
| Foot | CP-L006A | CP-L010A | CP-L016A |
| Trunnion (with pin) | CP-T006A | CP-T010A | CP-T016A |

Weight

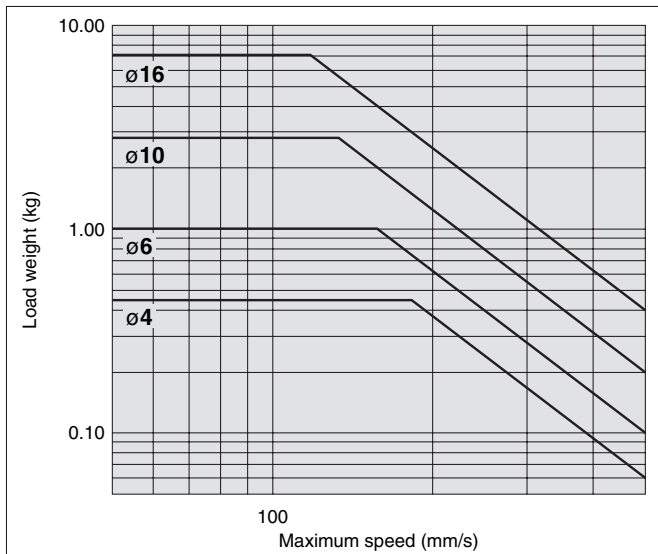
| Stroke (mm) | Mounting | Bore size (mm) | | | |
|---------------------------------------|---------------------|----------------|----|----|----|
| | | 4 | 6 | 10 | 16 |
| Basic weight | 5 | 11 | 16 | 27 | 42 |
| | 10 | 13 | 18 | 29 | 46 |
| | 15 | 15 | 21 | 32 | 50 |
| | 20 | 17 | 23 | 35 | 54 |
| | 25 | — | 25 | 37 | 58 |
| | 30 | — | — | 40 | 63 |
| | 35 | — | — | 43 | 67 |
| | 40 | — | — | 45 | 71 |
| Bracket weight | Flange | — | 5 | 6 | 16 |
| | Foot | — | 7 | 9 | 24 |
| | Clevis | — | 2 | 5 | 8 |
| | Trunnion (with pin) | — | 15 | 25 | 70 |
| Additional weight for built-in magnet | | 2 | 3 | 5 | 7 |

Allowable Kinetic Energy

⚠ Caution

When driving an inertial load, operate a cylinder with kinetic energy within the allowable value. The range in the chart below that is delineated by bold solid lines indicates the relation between load weights and maximum driving speeds.

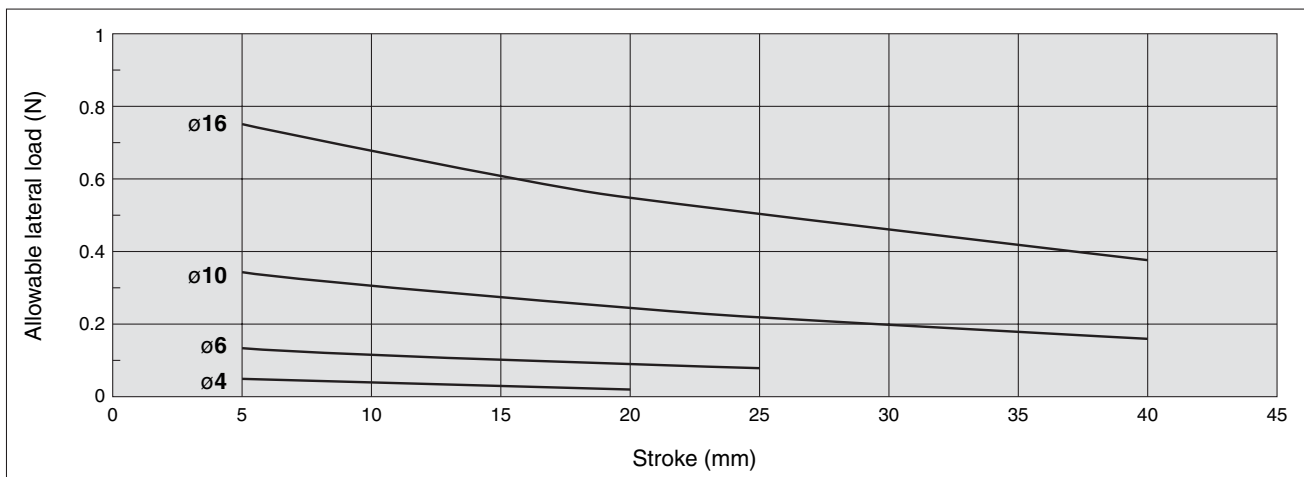
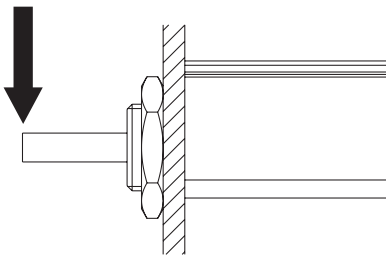
| Bore size (mm) | 4 | 6 | 10 | 16 |
|------------------------------|-----------------------|----------------------|----------------------|----------------------|
| Piston speed (m/s) | 0.05 to 0.5 | | | |
| Allowable kinetic energy (J) | 0.75×10^{-2} | 1.2×10^{-2} | 2.5×10^{-2} | 5.0×10^{-2} |



Allowable Lateral Load

Strictly observe the limiting range of lateral load on a piston rod. (Refer to the below graph.) If this product is used beyond the limits, it may shorten the machine life or cause damage.

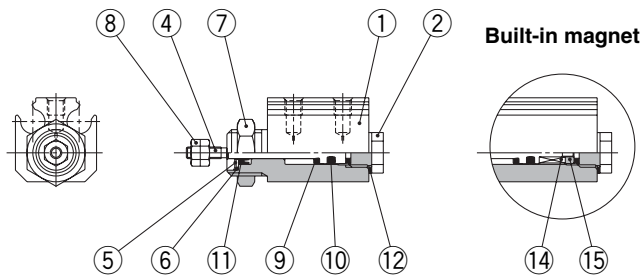
Allowable lateral load



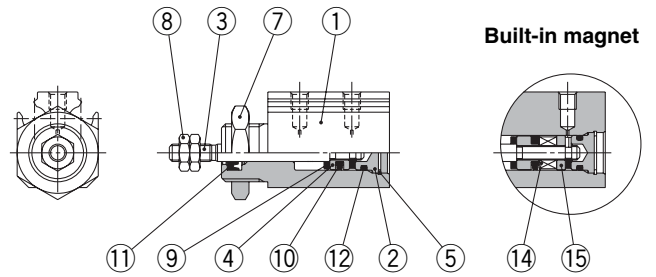
Series CJP2

Construction

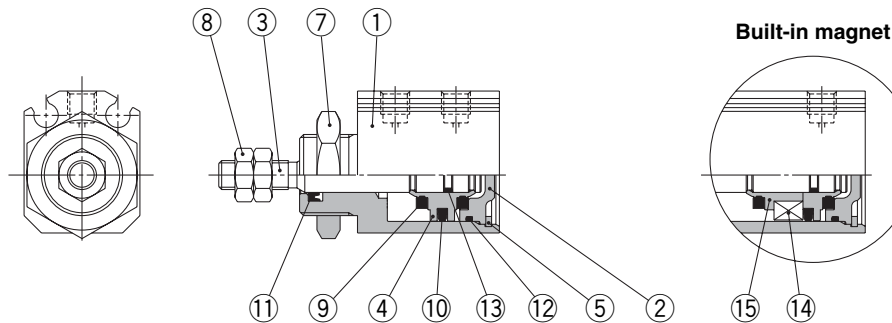
C□JP2B4



C□JP2B6



C□JP2B10, 16



Component Parts

| No. | Description | | Material | Note |
|-----|------------------------|--------------|-----------------------|---------------------------|
| 1 | Body | | Aluminum alloy | Hard anodized |
| 2 | Head cover | ø4, ø6, ø10 | Brass | Electroless nickel plated |
| | | ø16 | Aluminum alloy | Chromated |
| 3 | Piston rod | | Stainless steel | |
| 4 | Piston | ø4 | Stainless steel | |
| | | ø6, ø10 | Brass | |
| | | ø16 | Aluminum alloy | Chromated |
| 5 | Snap ring | | Tool steel | Phosphate coating |
| 6 | Seal retainer | | Special steel | Nickel plated |
| 7 | Mounting nut | | Brass | Electroless nickel plated |
| 8 | Rod end nut | | Steel | Nickel plated |
| 9 | Bumper | | Urethane rubber | |
| 10 | Piston seal | | NBR | |
| 11 | Rod seal | | NBR | |
| 12 | Gasket | ø4 | Stainless steel + NBR | |
| | | ø6, ø10, ø16 | NBR | |
| 13 | Piston gasket | | NBR | |
| 14 | Magnet | | Magnetic material | |
| 15 | Magnet retainer | ø4, ø6, ø10 | Brass | |
| | | ø16 | Aluminum alloy | Chromated |

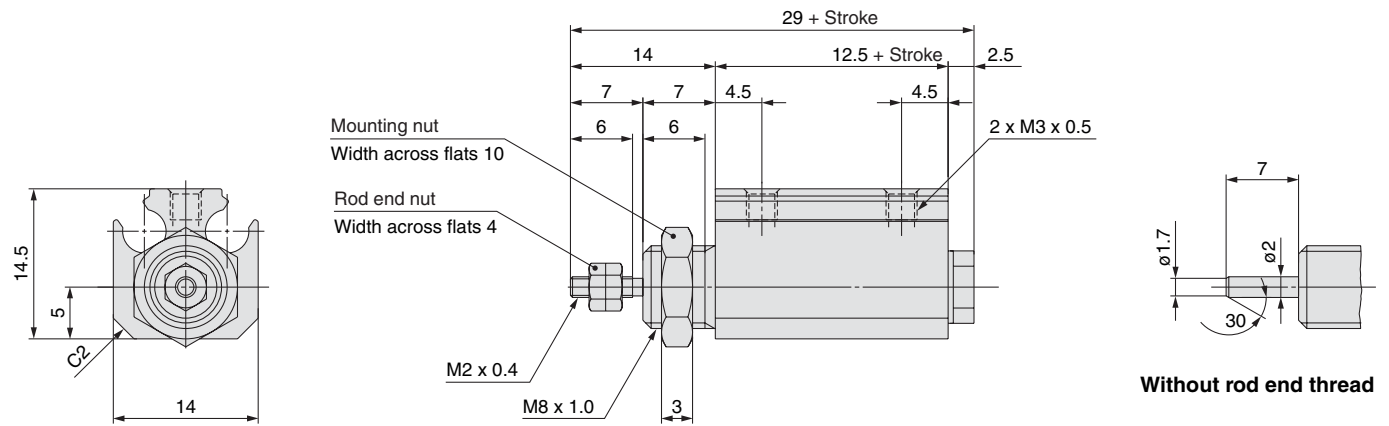
Replacement Parts: Seal Kit

| Bore size (mm) | Kit no. | Contents |
|----------------|------------|---|
| 6 | CJP2B6-PS | Piston seal, Rod seal, Gasket, Grease pack (5 g) |
| 10 | CJP2B10-PS | |
| 16 | CJP2B16-PS | |

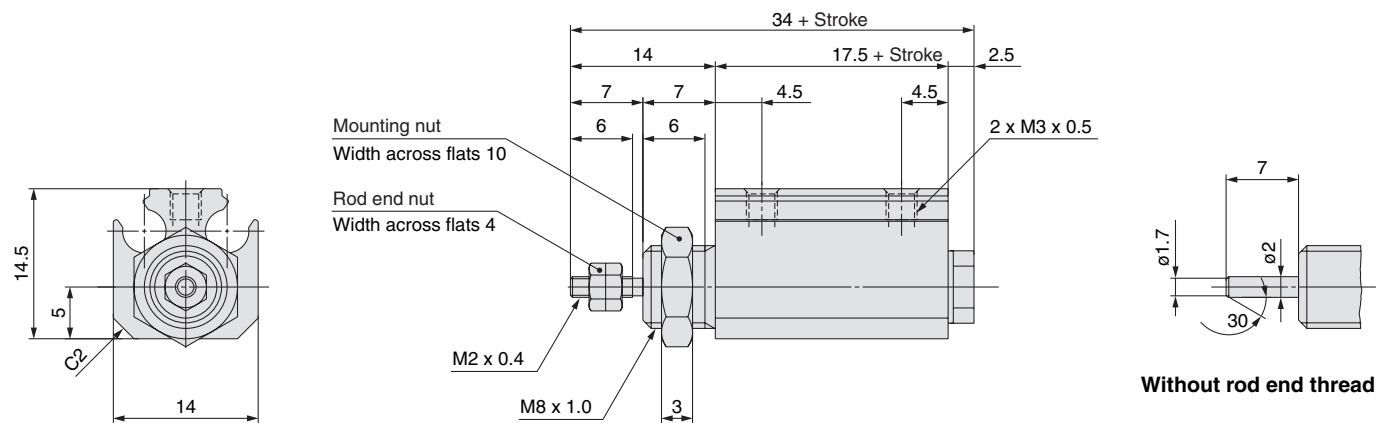
* Seal kit includes above contents. Order the seal kit, based on each bore size.

Dimensions: Basic Mounting (ø4)

Without magnet: CJP2B4



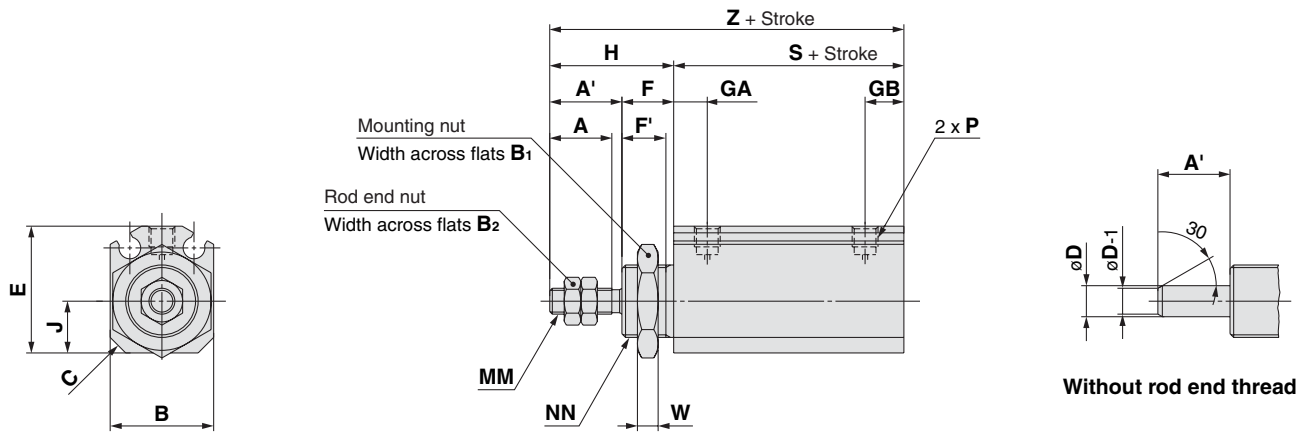
Built-in magnet: CDJP2B4



Series CJP2

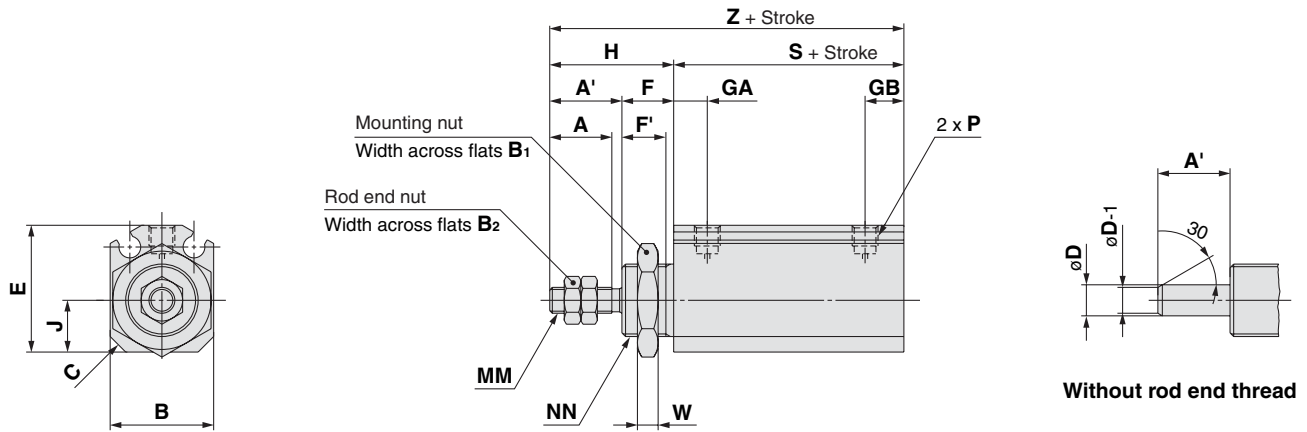
Dimensions: Basic Mounting (ø6 to ø16)

Without magnet: CJP2B6 to 16



| Symbol | A | A' | B | B ₁ | B ₂ | C | D | E | F | F' | GA | GB | H | J | MM | NN | P | S | W | Z |
|-----------|----|----|----|----------------|----------------|-----|---|------|----|-----|-----|-----|----|----|----------|-----------|----------|------|---|------|
| Bore size | | | | | | | | | | | | | | | | | | | | |
| 6 | 7 | 9 | 14 | 14 | 5.5 | 2 | 3 | 16.5 | 8 | 6.5 | 5.5 | 6.5 | 17 | 6 | M3 x 0.5 | M10 x 1.0 | M3 x 0.5 | 16 | 3 | 33 |
| 10 | 10 | 12 | 15 | 17 | 7 | 2.5 | 4 | 19 | 8 | 6.5 | 6 | 7 | 20 | 7 | M4 x 0.7 | M12 x 1.0 | M3 x 0.5 | 19.5 | 3 | 39.5 |
| 16 | 12 | 14 | 20 | 19 | 8 | 3 | 6 | 24.5 | 10 | 8.5 | 6.5 | 7.5 | 24 | 10 | M5 x 0.8 | M14 x 1.0 | M5 x 0.8 | 19.5 | 4 | 43.5 |

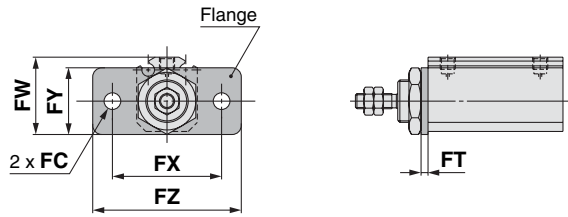
Built-in magnet: CDJP2B6 to 16



| Symbol | A | A' | B | B ₁ | B ₂ | C | D | E | F | F' | GA | GB | H | J | MM | NN | P | S | W | Z |
|-----------|----|----|----|----------------|----------------|-----|---|------|----|-----|-----|-----|----|----|----------|-----------|----------|------|---|------|
| Bore size | | | | | | | | | | | | | | | | | | | | |
| 6 | 7 | 9 | 14 | 14 | 5.5 | 2 | 3 | 16.5 | 8 | 6.5 | 5.5 | 6.5 | 17 | 6 | M3 x 0.5 | M10 x 1.0 | M3 x 0.5 | 21 | 3 | 38 |
| 10 | 10 | 12 | 15 | 17 | 7 | 2.5 | 4 | 19 | 8 | 6.5 | 6 | 7 | 20 | 7 | M4 x 0.7 | M12 x 1.0 | M3 x 0.5 | 24.5 | 3 | 44.5 |
| 16 | 12 | 14 | 20 | 19 | 8 | 3 | 6 | 24.5 | 10 | 8.5 | 6.5 | 7.5 | 24 | 10 | M5 x 0.8 | M14 x 1.0 | M5 x 0.8 | 24.5 | 4 | 48.5 |

Mounting Bracket Dimensions

Flange: C(D)JP2F6 to 16

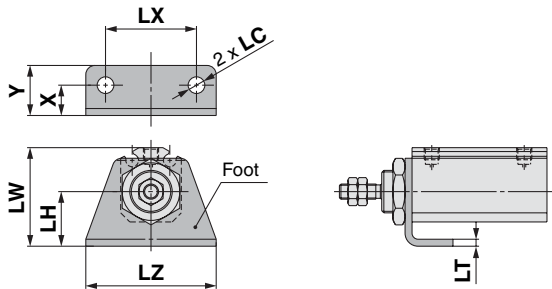


Flange

| Symbol | (mm) | | | | | |
|-----------|------|-----|------|----|----|----|
| Bore size | FC | FT | FW | FX | FY | FZ |
| 6 | 3.4 | 1.6 | 18.5 | 24 | 16 | 32 |
| 10 | 4.5 | 1.6 | 21 | 28 | 18 | 37 |
| 16 | 5.5 | 2.3 | 25.5 | 36 | 22 | 49 |

* Other dimensions are the same as basic mounting.

Foot: C(D)JP2L6 to 16

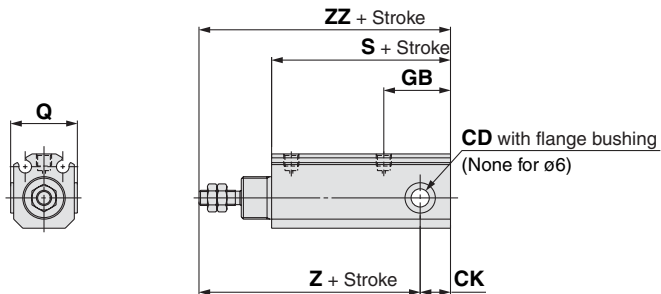


Foot

| Symbol | (mm) | | | | | | | |
|-----------|------|------|-----|----|-----|------|----|----|
| Bore size | X | Y | LC | LH | LT | LW | LX | LZ |
| 6 | 6.5 | 10.5 | 3.4 | 11 | 1.6 | 21.5 | 20 | 28 |
| 10 | 7 | 12 | 4.5 | 13 | 1.6 | 25 | 24 | 33 |
| 16 | 10 | 16.5 | 5.5 | 18 | 2.3 | 32.5 | 30 | 43 |

* Other dimensions are the same as basic mounting.

Clevis: C(D)JP2D6 to 16

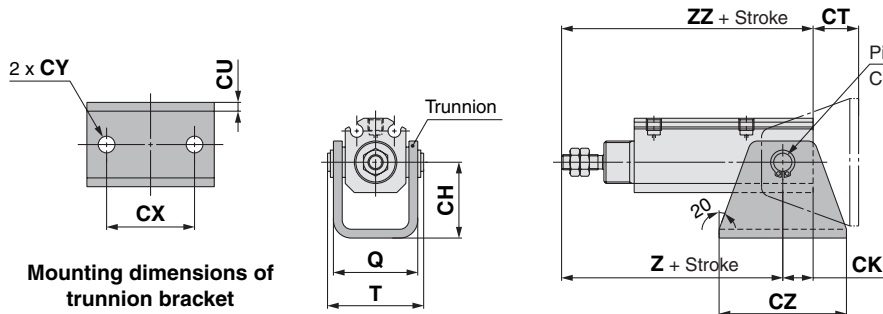


Clevis

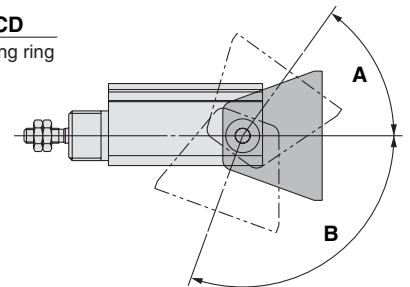
| Symbol | (mm) | | | |
|-----------|----------------------------------|-----|------|---------------------------------|
| Bore size | CD | CK | GB | Q |
| 6 | 3 ^{+0.040} ₀ | 4 | 11.5 | — |
| 10 | 5 ^{+0.065} ₀ | 6.5 | 18 | 17 ⁰ _{-0.5} |
| 16 | 6 ^{+0.065} ₀ | 10 | 22 | 22 ⁰ _{-0.5} |

| Symbol | S | | Z | | ZZ | |
|-----------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| Bore size | Without magnet | Built-in magnet | Without magnet | Built-in magnet | Without magnet | Built-in magnet |
| 6 | 21 | 26 | 34 | 39 | 38 | 43 |
| 10 | 30.5 | 35.5 | 44 | 49 | 50.5 | 55.5 |
| 16 | 34 | 39 | 48 | 53 | 58 | 63 |

Trunnion: C(D)JP2T6 to 16



Rotation angle



Trunnion

| Symbol | (mm) | | | | | | | | | | |
|-----------|------|----|-----|------|-----|----|-----|----|------|------|----|
| Bore size | CD | CH | CK | CT | CU | CX | CY | CZ | Q | T | Z |
| 6 | 3 | 16 | 4 | 12 | 1.6 | 18 | 3.4 | 26 | 18.5 | 20.4 | 34 |
| 10 | 5 | 20 | 6.5 | 13.5 | 1.6 | 24 | 4.5 | 33 | 20.5 | 23.9 | 44 |
| 16 | 6 | 25 | 10 | 15 | 2.9 | 29 | 5.5 | 42 | 28 | 31.7 | 48 |

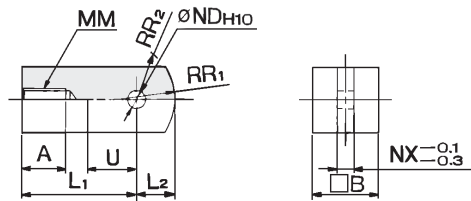
| Bore size | Without magnet | Built-in magnet | Without magnet | Built-in magnet |
|-----------|----------------|-----------------|----------------|-----------------|
| 6 | 38 | 43 | 38 | 43 |
| 10 | 50.5 | 55.5 | 50.5 | 55.5 |
| 16 | 58 | 63 | 58 | 63 |

| Applicable bore | ø6 | ø10 | ø16 |
|-----------------|------|------|------|
| A | 54° | 62° | 55° |
| B | 110° | 110° | 102° |

* Provided as guidelines.
The values are varied depending on the condition.

Accessory Bracket Dimensions

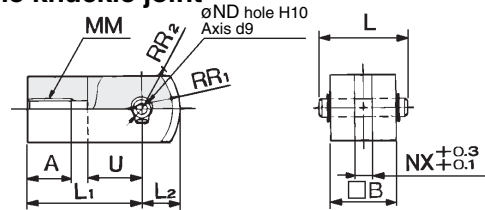
Single knuckle joint



Material: Rolled steel

| Part no. | Applicable bore size (mm) | A | B | L ₁ | L ₂ | MM | ND _{H10} | NX | R ₁ | R ₂ | U |
|----------|---------------------------|-----|----|----------------|----------------|----------|----------------------------------|----|----------------|----------------|---|
| I-P006A | 6 | 5 | 6 | 12 | 3.5 | M3 x 0.5 | 3 ^{+0.040} ₀ | 3 | 5 | 4 | 5 |
| I-P010A | 10 | 6.5 | 10 | 16 | 5.5 | M4 x 0.7 | 5 ^{+0.048} ₀ | 5 | 8 | 6.3 | 7 |
| I-P016A | 16 | 7 | 12 | 19 | 7 | M5 x 0.8 | 6 ^{+0.048} ₀ | 6 | 10 | 7.8 | 9 |

Double knuckle joint

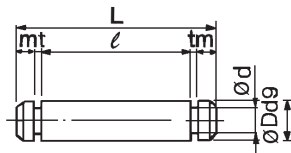


Material: Rolled steel

| Part no. | Applicable bore size (mm) | A | B | L | L ₁ | L ₂ | MM | ND _{d9} | ND _{H10} | NX | R ₁ | R ₂ | U |
|----------|---------------------------|-----|----|------|----------------|----------------|----------|---------------------------------------|----------------------------------|----|----------------|----------------|---|
| Y-P006A | 6 | 5 | 6 | 9 | 12 | 3.5 | M3 x 0.5 | 3 ^{-0.020} _{-0.045} | 3 ^{+0.040} ₀ | 3 | 5 | 4 | 5 |
| Y-P010A | 10 | 6.5 | 10 | 13.6 | 16 | 5.5 | M4 x 0.7 | 5 ^{-0.030} _{-0.060} | 5 ^{+0.048} ₀ | 5 | 8 | 6.3 | 7 |
| Y-P016A | 16 | 7 | 12 | 15.8 | 19 | 7 | M5 x 0.8 | 6 ^{-0.030} _{-0.060} | 6 ^{+0.048} ₀ | 6 | 10 | 7.8 | 9 |

* Knuckle pin and retaining ring are included.

Knuckle pin

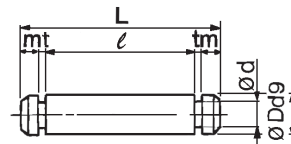


Material: Stainless steel

| Part no. | Applicable bore size (mm) | D d9 | L | d | ℓ | m | t | Retaining* ring |
|----------|---------------------------|---------------------------------------|------|------|------|------|------|-----------------|
| IY-P006 | 6 | 3 ^{-0.020} _{-0.045} | 9 | 2.85 | 6.2 | 0.75 | 0.65 | Clip C-type 3 |
| IY-P010 | 10 | 5 ^{-0.030} _{-0.060} | 13.6 | 4.8 | 10.2 | 1 | 0.7 | C-type 5 |
| IY-P015 | 16 | 6 ^{-0.030} _{-0.060} | 15.8 | 5.7 | 12.2 | 1 | 0.8 | C-type 6 |

* Included

Trunnion pin

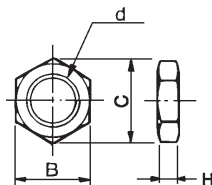


Material: Stainless steel

| Part no. | Applicable bore size (mm) | D d9 | L | d | ℓ | m | t | Retaining* ring |
|----------|---------------------------|---------------------------------------|------|------|------|------|------|-----------------|
| CT-P006 | 6 | 3 ^{-0.020} _{-0.045} | 20.4 | 2.85 | 17.6 | 0.75 | 0.65 | Clip C-type 3 |
| CT-P010 | 10 | 5 ^{-0.030} _{-0.060} | 23.9 | 4.8 | 20.5 | 1 | 0.7 | C-type 5 |
| CT-P015 | 16 | 6 ^{-0.030} _{-0.060} | 31.7 | 5.7 | 28.1 | 1 | 0.8 | C-type 6 |

* Included

Mounting nut

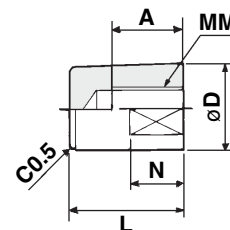


Material: Brass

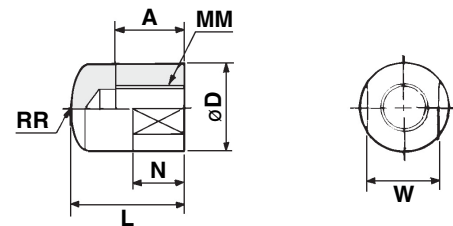
| Part no. | Applicable bore size (mm) | d | H | B | C |
|----------|---------------------------|-----------|---|----|------|
| SNPS-004 | 4 | M8 x 1.0 | 3 | 10 | 11.5 |
| SNP-006 | 6 | M10 x 1.0 | 3 | 14 | 16.2 |
| SNP-010 | 10 | M12 x 1.0 | 3 | 17 | 19.6 |
| SNP-015 | 16 | M14 x 1.0 | 4 | 19 | 21.9 |

Rod end cap

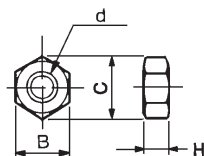
Flat type: CJ-CF□□□



Round type: CJ-CR□□□



Rod end nut



Material: Iron

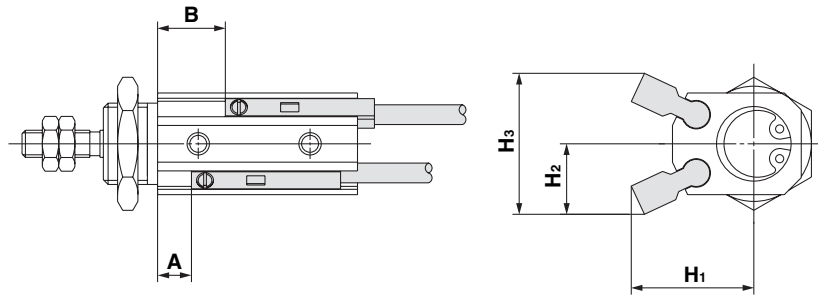
| Part no. | Applicable bore size (mm) | d | H | B | C |
|----------|---------------------------|----------|-----|-----|-----|
| NTJ-004 | 4 | M2 x 0.4 | 1.6 | 4 | 4.6 |
| NTP-006 | 6 | M3 x 0.5 | 1.8 | 5.5 | 6.4 |
| NTP-010 | 10 | M4 x 0.7 | 2.4 | 7 | 8.1 |
| NTP-015 | 16 | M5 x 0.8 | 3.2 | 8 | 9.2 |

Material: Polyacetal

| Part no. | Applicable bore size (mm) | A | D | L | MM | N | RR | W |
|-----------|---------------------------|----|----|----|----|----------|----|----|
| Flat type | Round type | | | | | | | |
| CJ-CF004 | CJ-CR004 | 4 | 5 | 6 | 9 | M2 x 0.4 | 3 | 6 |
| CJ-CF006 | CJ-CR006 | 6 | 6 | 8 | 11 | M3 x 0.5 | 5 | 8 |
| CJ-CF010 | CJ-CR010 | 10 | 8 | 10 | 13 | M4 x 0.7 | 6 | 10 |
| CJ-CF016 | CJ-CR016 | 16 | 10 | 12 | 15 | M5 x 0.8 | 7 | 12 |

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

D-A9□(V), D-M9□(V), D-M9□W(V)



Applicable Auto Switches: D-A9□, D-A9□V

(mm)

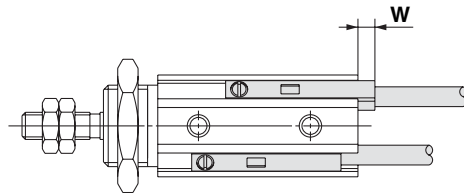
| Bore size | A (When detecting at extended stroke end position) | B (When detecting at retracted stroke end position) | | | | | | | | H ₁ | H ₂ | H ₃ |
|-----------|---|---|-------|-------|-------|-------|-------|-------|-------|----------------|----------------|----------------|
| | | 5 st | 10 st | 15 st | 20 st | 25 st | 30 st | 35 st | 40 st | | | |
| ø4 | — | — | — | — | — | — | — | — | — | — | — | — |
| ø6 | 1 | 6 | 11 | 16 | 21 | 26 | — | — | — | 13 | 10 | 20 |
| ø10 | 1 | 6 | 11 | 16 | 21 | 26 | 31 | 36 | 41 | 16 | 9.5 | 19 |
| ø16 | 1 | 6 | 11 | 16 | 21 | 26 | 31 | 36 | 41 | 18 | 12 | 24 |

Applicable Auto Switches: D-M9□, D-M9□V, D-M9□W, D-M9□WV

(mm)

| Bore size | A (When detecting at extended stroke end position) | B (When detecting at retracted stroke end position) | | | | | | | | H ₁ | H ₂ | H ₃ |
|-----------|---|---|-------|-------|-------|-------|-------|-------|-------|----------------|----------------|----------------|
| | | 5 st | 10 st | 15 st | 20 st | 25 st | 30 st | 35 st | 40 st | | | |
| ø4 | 4 | 9 | 14 | 19 | — | — | — | — | — | 14.5 | 11.5 | 23 |
| ø6 | 5 | 10 | 15 | 20 | 25 | 30 | — | — | — | 15 | 11.5 | 23 |
| ø10 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 18 | 10.5 | 21 |
| ø16 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 20 | 13 | 26 |

Note) Only adjust the setting position after confirming the auto switch is properly activated.



Mounting: Basic, Flange, Foot

(mm)

| Auto switch model | D-M9□ D-M9□W | D-M9□V D-M9□WV | D-A90 D-A96 D-A9□V | D-A93 |
|-------------------|-----------------|-------------------|--------------------------|-------|
| Bore size | W | | | |
| ø4 | 6 | 4 | — | — |
| ø6 | 6 | 4 | 2 | 4.5 |
| ø10 | 2.5 | 0.5 | 0 | 1 |
| ø16 | 2.5 | 0.5 | 0 | 1 |

Mounting: Clevis, Trunnion

(mm)

| Auto switch model | D-M9□ D-M9□W | D-M9□V D-M9□WV D-A9□ D-A9□V |
|-------------------|-----------------|--------------------------------------|
| Bore size | W | |
| ø4 | — | — |
| ø6 | 1 | 0 |
| ø10 | 0 | 0 |
| ø16 | 0 | 0 |

* 0 (zero) denotes the switch does not protrude from the end surface.

Series CJP2

Operating Range

| Auto switch model | Bore size (mm) | | | |
|-------------------|----------------|-----|----|-----|
| | 4 | 6 | 10 | 16 |
| D-A9□(V) | — | 5 | 6 | 7 |
| D-M9□(V) | 2 | 2 | 2 | 2 |
| D-M9□W(V) | 2.5 | 2.5 | 3 | 3.5 |

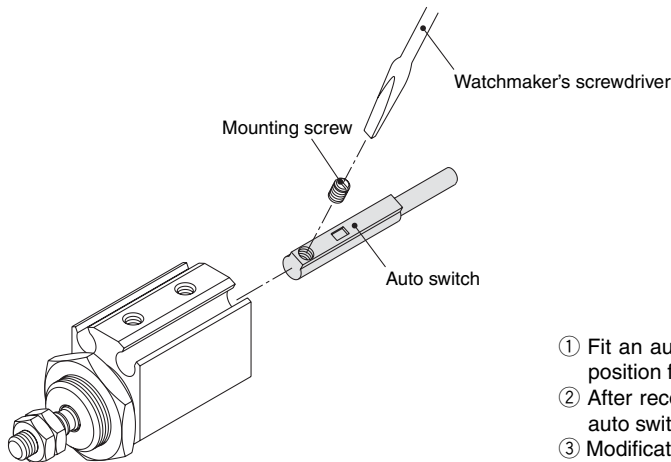
* Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately $\pm 30\%$ dispersion.)

There may be the case it will vary substantially depending on an ambient environment.

Minimum Stroke for Auto Switch Mounting

| No. of auto switches mounted | Applicable auto switch model (mm) | | |
|------------------------------|-----------------------------------|----------------------|------------------------|
| | D-A9□, D-A9□V | D-M9□, D-M9□V | D-M9□W, D-M9□WV |
| 1 | 5 | 5 | 5 |
| 2 | 10 | 5 | 10 |

Mounting and Moving Auto Switches



- ① Fit an auto switch into the switch mounting groove to set it roughly to the mounting position for an auto switch.
- ② After reconfirming the detecting position, tighten the mounting screw* to secure the auto switch.
- ③ Modification of the detecting position should be made in the condition of ①.

* When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle of approximately 5 to 6 mm in diameter.
(Use a tightening torque of approximately 0.10 to 0.20 N·m.)

⚠ Specific Product Precautions

Before handling auto switches, refer to the back of page 2 through to 5 for Auto Switches Precautions.

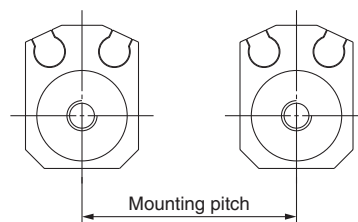
⚠ Caution

1. If auto switch cylinders are used in parallel, keep the distance between cylinders in accordance with the below chart.

Mounting Pitch (mm)

| Auto switch model | Bore size (mm) | | | |
|-------------------------------------|----------------|----|----|----|
| | 4 | 6 | 10 | 16 |
| D-A9□(V) | — | 20 | 25 | 30 |
| D-M9□(V) D-M9□W(V) | 25 | 25 | 30 | 35 |

Use caution not to use them, getting closer than the specified pitch. Otherwise, it may cause auto switch to malfunction.



⚠ Specific Product Precautions

Be sure to read this before handling. Consult with SMC for the use other than the specifications.

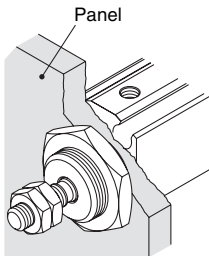
Mounting

⚠ Caution

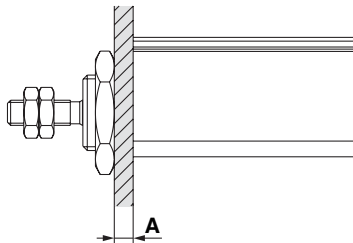
Mounting nut maximum tightening torque and panel width

- ① Do not apply more torque than the maximum torque range when mounting the cylinder or bracket. Also, do not attach a panel with a thickness beyond the specified range.

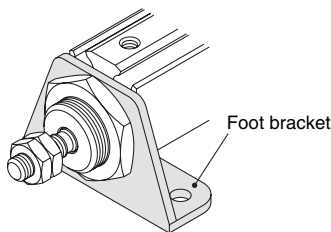
| Cylinder bore size | Thread | Maximum tightening torque (N·m) | A dimension maximum value (mm) |
|--------------------|---------|---------------------------------|--------------------------------|
| ø4 | M8 x 1 | 6.2 | 3 |
| ø6 | M10 x 1 | 12.5 | 4 |
| ø10 | M12 x 1 | 21.0 | 4 |
| ø16 | M14 x 1 | 34.0 | 5 |



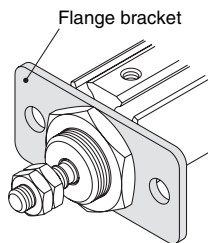
Panel mounting



Panel maximum thickness



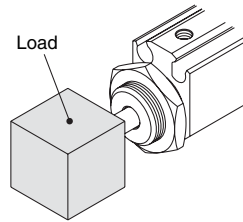
Foot mounting



Flange mounting

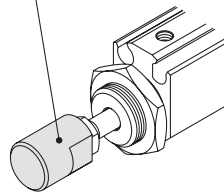
- ② Do not apply more tightening torque than the below specified range when attaching a load on the rod end, rod end cap, single or double knuckle joint.

| Applicable bore size | Thread size | Maximum tightening torque (N·m) |
|----------------------|-------------|---------------------------------|
| ø4 | M2 x 0.4 | 0.1 |
| ø6 | M3 x 0.5 | 0.3 |
| ø10 | M4 x 0.7 | 0.8 |
| ø16 | M5 x 0.8 | 1.6 |



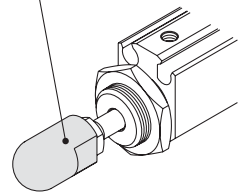
Rod end load mounting

Rod end cap (flat type)



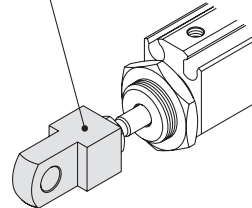
Rod end cap (flat type) mounting

Rod end cap (round type)



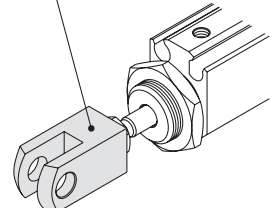
Rod end cap (round type) mounting

Single knuckle joint



Single knuckle joint mounting

Double knuckle joint



Double knuckle joint mounting

Disassembly and Maintenance

⚠ Caution

Snap ring installation / removal

- To replace seals or grease the cylinder during maintenance, use an appropriate pair of pliers (tool for installing a C-type retaining ring for hole).

After re-installing the cylinder, make sure that the snap ring is placed securely in the groove before supplying air.

- To remove and install the snap ring for the knuckle pin or the trunnion pin, use an appropriate pair of pliers (tool for installing a C-type retaining ring for hole). In particular, use a pair of ultra-mini pliers, for removing and installing the snap rings on the ø6 cylinder.

Do not disassemble the CJP4 cylinder. Do not loosen or remove the head cover.

Pin Cylinder: Single Acting, Spring Return

Series CJP

ø4, ø6, ø10, ø15

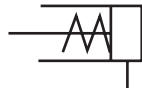
A short stroke miniature cylinder with a shorter overall length.

The installation space can be significantly reduced because this cylinder can be recessed directly into a machine body or installed on a panel. Thus, the machine can be made more compact.



JIS Symbol

Single acting, Spring return

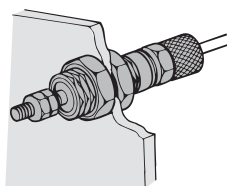


Made to Order
(For details, refer to page 22, 23.)

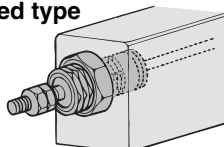
| Symbol | Specifications |
|--------|--------------------------------|
| XC17 | Pin cylinder with rod quenched |
| XC22 | Fluoro rubber seals |

Mounting

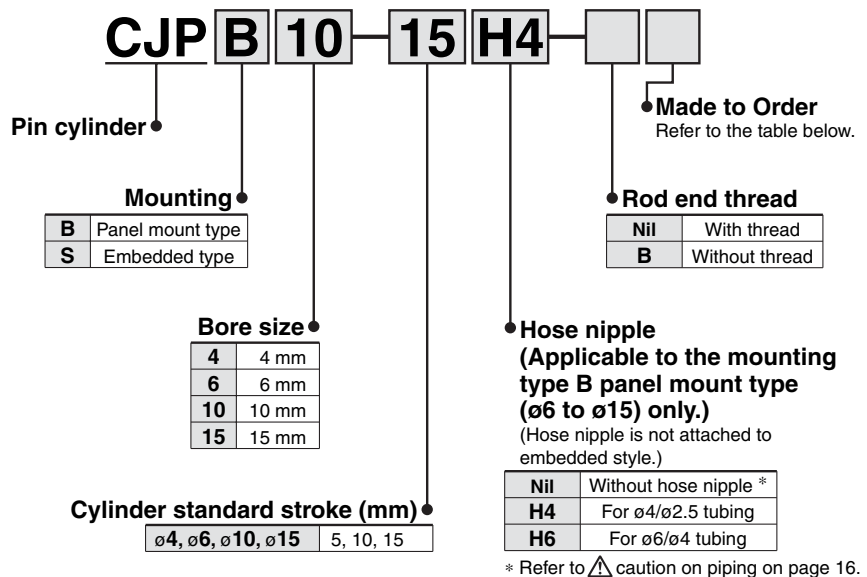
Panel mount type



Embedded type



How to Order

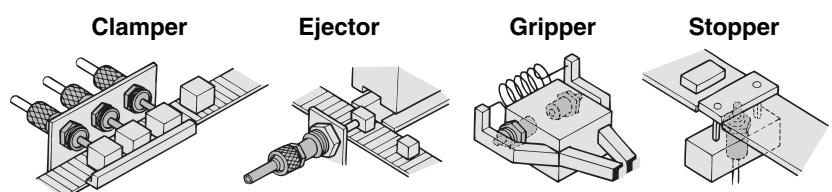


Specifications

| | | | |
|---------------------------------------|---------------------------|---------------------------------------|---|
| Action | | Single acting, Spring return | |
| Maximum operating pressure | | 0.7 MPa | |
| Minimum operating pressure | ø4 | 0.3 MPa | |
| | ø6 | 0.2 MPa | |
| | ø10, ø15 | 0.15 MPa | |
| Proof pressure | | 1.05 MPa | |
| Ambient and fluid temperature | | -10 to 70°C (No freezing) | |
| Lubrication | | Not required (Non-lube) | |
| Piston speed | | 50 to 500 mm/s | |
| Cushion | | None | |
| Stroke length tolerance | | +1.0 0 | |
| Thread tolerance | | JIS Class 2 | |
| Rod end style | | With thread/Without thread | |
| Mounting | | Panel mount type | Embedded type |
| Accessory (Standard equipment) | Standard equipment | Mounting nut (2) Rod end nut (2) * | Mounting nut (1) Gasket (1) Rod end nut (2) * |
| | Option | Hose nipple (Except ø4) | — |

* When rod end is threaded.

Application Examples



Standard Stroke

| Bore size (mm) | Stroke (mm) |
|----------------|-------------|
| 4 | 5, 10, 15 |
| 6 | 5, 10, 15 |
| 10 | 5, 10, 15 |
| 15 | 5, 10, 15 |

Weight

| Model | Stroke (mm) | | |
|--------|-------------|------|------|
| | 5 | 10 | 15 |
| CJP□4 | 10 | 13 | 15 |
| CJP□6 | 10.6 | 13.1 | 15.6 |
| CJP□10 | 28 | 33 | 38 |
| CJP□15 | 72 | 82 | 92 |

*Weight of hose nipple (4 g) for panel mounting is excluded.

Theoretical Output

| Bore size (mm) | Operating direction | Operating pressure (MPa) | | |
|----------------|---------------------|--------------------------|------|------|
| | | 0.3 | 0.5 | 0.7 |
| 4 | OUT | 0.97 | 3.48 | 6.00 |
| | IN | 1.0 | | |
| 6 | OUT | 4.56 | 10.2 | 15.9 |
| | IN | 1.42 | | |
| 10 | OUT | 17.6 | 33.3 | 49.0 |
| | IN | 2.45 | | |
| 15 | OUT | 42.2 | 77.5 | 113 |
| | IN | 4.41 | | |

Spring Reaction Force

| Bore size (mm) | Stroke (mm) | Retracted side | Extended side |
|----------------|-------------|----------------|---------------|
| 4 | 5, 10, 15 | 2.80 | 1.00 |
| 6 | 5, 10, 15 | 3.92 | 1.42 |
| 10 | 5, 10, 15 | 5.98 | 2.45 |
| 15 | 5, 10, 15 | 10.80 | 4.41 |

* Same spring force for each stroke.

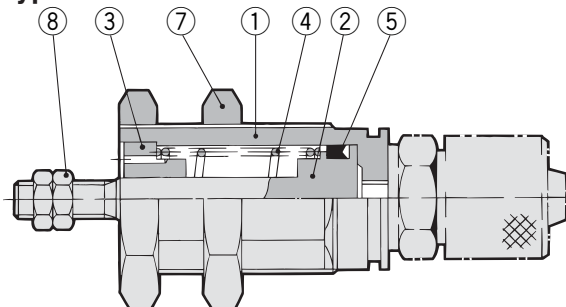
Hose Nipple Dedicated for Panel Mount Type

(With fixed orifice)

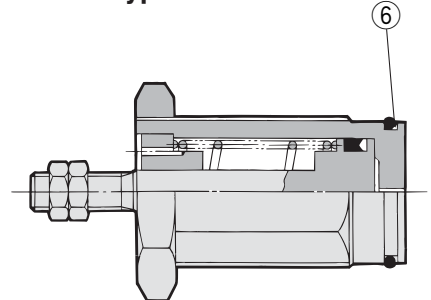
| Applicable tubing | Part no. |
|--------------------|----------|
| For ø4/ø2.5 tubing | CJ-5H-4 |
| For ø6/ø4 tubing | CJ-5H-6 |

Construction (Not able to disassemble.)

Panel mount type



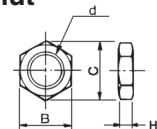
Embedded type



Component Parts

| No. | Description | Material | Note |
|-----|---------------|--------------------------------|---|
| 1 | Cover | Brass | Electroless nickel plated |
| 2 | Piston | Stainless steel | |
| 3 | Collar | Oil-impregnated sintered alloy | ø4 Brass + Electroless nickel plated |
| | | | ø6, ø10 Bronze |
| 4 | Return spring | Steel wire | Zinc chromated |
| 5 | Piston seal | NBR | |
| 6 | Gasket | NBR | Special product (O-ring) embedded type only |
| 7 | Mounting nut | Brass | Electroless nickel plated |
| 8 | Rod end nut | Steel | Nickel plated |

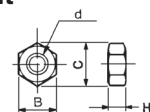
Mounting nut



Material: Brass

| Part no. | Applicable bore size (mm) | d | H | B | C |
|----------|---------------------------|-----------|---|----|------|
| SNPS-004 | 4 | M8 x 1.0 | 3 | 10 | 11.5 |
| SNPS-006 | 6 | M10 x 1.0 | 3 | 12 | 13.9 |
| SNPS-010 | 10 | M15 x 1.5 | 4 | 19 | 22 |
| SNPS-015 | 15 | M22 x 1.5 | 5 | 27 | 31 |

Rod end nut



Material: Steel

| Part no. | Applicable bore size (mm) | d | H | B | C |
|----------|---------------------------|----------|-----|-----|-----|
| NTJ-004 | 4 | M2 x 0.4 | 1.6 | 4 | 4.6 |
| NTP-006 | 6 | M3 x 0.5 | 1.8 | 5.5 | 6.4 |
| NTP-010 | 10 | M4 x 0.7 | 2.4 | 7 | 8.1 |
| NTP-015 | 15 | M5 x 0.8 | 3.2 | 8 | 9.2 |

Dedicated Nut / Part No.

| Bore size (mm) | 4 | 6 | 10 | 15 |
|----------------|----------|----------|----------|----------|
| Description | | | | |
| Mounting nut | SNPS-004 | SNPS-006 | SNPS-010 | SNPS-015 |
| Rod end nut | NTJ-004 | NTP-006 | NTP-010 | NTP-015 |

Replacement Parts / Gasket

| Bore size (mm) | Order no. | Contents |
|----------------|-----------|-------------|
| 4 | CJPS4-G | Above no. ⑥ |
| 6 | CJPS6-G | |
| 10 | CJPS10-G | |
| 15 | CJPS15-G | |

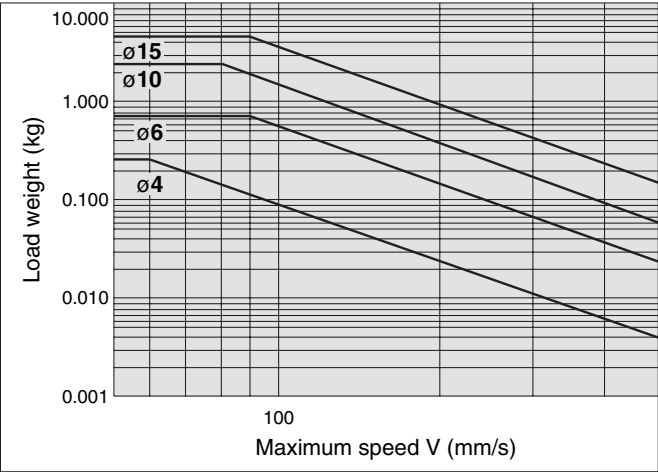
* Dedicated for the embedded type.

Allowable Kinetic Energy

⚠ Caution

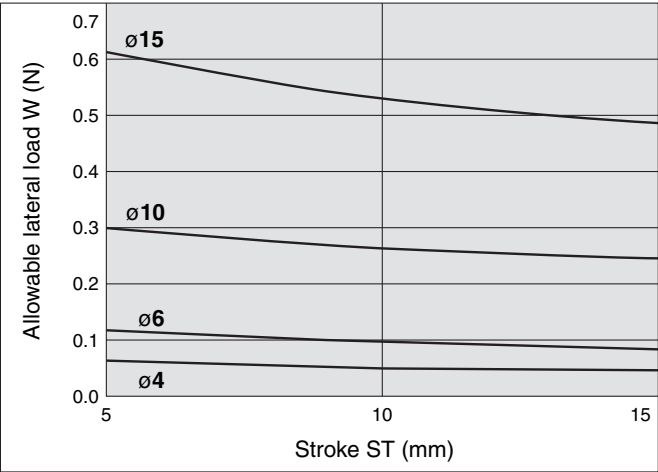
When driving an inertial load, operate a cylinder with kinetic energy within the allowable value. The range in the chart below that is delineated by bold solid lines indicates the relation between load weights and maximum driving speeds.

| Bore size (mm) | 4 | 6 | 10 | 15 |
|------------------------------|----------------------|--------------------|--------------------|---------------------|
| Piston speed (m/s) | 0.05 to 0.5 | | | |
| Allowable kinetic energy (J) | 0.5×10^{-3} | 3×10^{-3} | 8×10^{-3} | 19×10^{-3} |



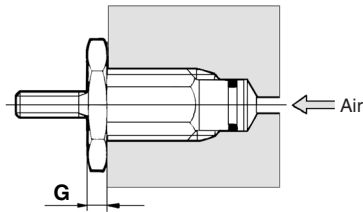
Allowable Lateral Load

Strictly observe the limiting range of lateral load on a piston rod. (Refer to the below graph.) If this product is used beyond the limits, it may shorten the machine life or cause damage.

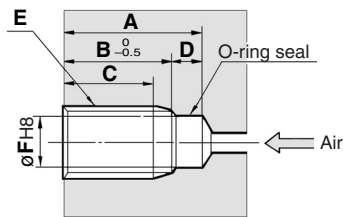


Recommended Mounting Hole Dimensions for Embedded Type

When embedded



Machining dimensions for mounting

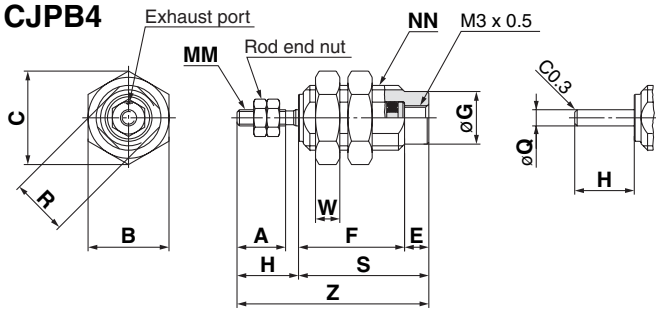


| Bore size (mm) | Stroke | A | B | C | D | E | F | G |
|----------------|--------|------|------|------|-----|-----------|-----|---|
| 4 | 5 | 12 | 8.5 | 6 | 3.5 | M8 x 1.0 | 6.5 | 3 |
| | 10 | 20 | 16.5 | 14 | | | | |
| | 15 | 28 | 24.5 | 22 | | | | |
| 6 | 5 | 16 | 12.5 | 10 | 3.5 | M10 x 1.0 | 8.5 | 3 |
| | 10 | 23 | 19.5 | 17 | | | | |
| | 15 | 30 | 26.5 | 24 | | | | |
| 10 | 5 | 17 | 13.5 | 10.5 | 3.5 | M15 x 1.5 | 12 | 4 |
| | 10 | 23.5 | 20 | 17 | | | | |
| | 15 | 30.5 | 27 | 24 | | | | |
| 15 | 5 | 19 | 14.5 | 11.5 | 4.5 | M22 x 1.5 | 19 | 5 |
| | 10 | 25 | 20.5 | 17.5 | | | | |
| | 15 | 31.5 | 27 | 24 | | | | |

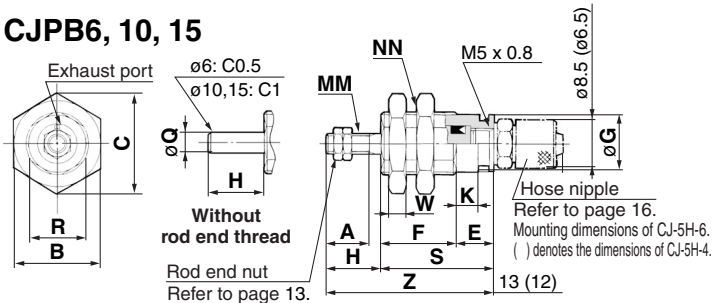
Note) E and ϕF should be machined in a concentric manner.

Dimensions: Panel Mount Type

CJPB4



CJPB6, 10, 15

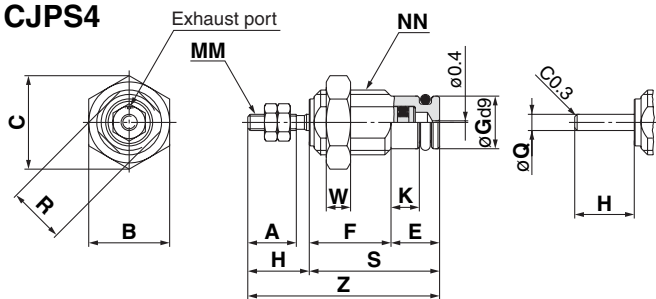


| Bore size (mm) | A | B | C | E | F | | | G | H | K | MM |
|----------------|----|----|------|---|-----------------|------------------|------------------|-----|-----|-----|----------|
| | | | | | 5 st | 10 st | 15 st | | | | |
| 4 | 6 | 10 | 11.5 | 3 | 13 | 21 | 29 | 6.5 | 7.5 | — | M2 x 0.4 |
| 6 | 7 | 12 | 13.9 | 6 | 12.5 | 19.5 | 26.5 | 8.5 | 9 | 3.5 | M3 x 0.5 |
| 10 | 10 | 19 | 22 | 6 | 14.5 | 21 | 28 | 12 | 12 | 3.5 | M4 x 0.7 |
| 15 | 12 | 27 | 31 | 7 | 16.5 | 22.5 | 29 | 19 | 14 | 4.2 | M5 x 0.8 |

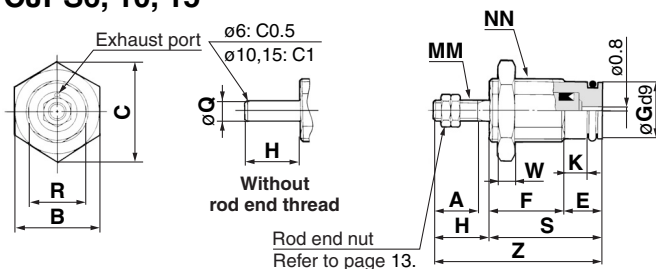
| Bore size (mm) | NN | R | S | | | W | Z | | | Q |
|----------------|-----------|----|-----------------|------------------|------------------|---|-----------------|------------------|------------------|---|
| | | | 5 st | 10 st | 15 st | | 5 st | 10 st | 15 st | |
| 4 | M8 x 1.0 | 7 | 16 | 24 | 32 | 3 | 23.5 | 31.5 | 39.5 | 2 |
| 6 | M10 x 1.0 | 9 | 18.5 | 25.5 | 32.5 | 3 | 27.5 | 34.5 | 41.5 | 3 |
| 10 | M15 x 1.5 | 13 | 20.5 | 27 | 34 | 4 | 32.5 | 39 | 46 | 5 |
| 15 | M22 x 1.5 | 20 | 23.5 | 29.5 | 36 | 5 | 37.5 | 43.5 | 50 | 6 |

Dimensions: Embedded Type

CJPS4



CJPS6, 10, 15



| Bore size (mm) | A | B | C | E | F | | | G | H | K | MM |
|----------------|----|----|------|---|-----------------|------------------|------------------|-----|-----|-----|----------|
| | | | | | 5 st | 10 st | 15 st | | | | |
| 4 | 6 | 10 | 11.5 | 6 | 10 | 18 | 26 | 6.5 | 7.5 | 3.5 | M2 x 0.4 |
| 6 | 7 | 12 | 13.9 | 6 | 12.5 | 19.5 | 26.5 | 8.5 | 9 | 3.5 | M3 x 0.5 |
| 10 | 10 | 19 | 22 | 6 | 14.5 | 21 | 28 | 12 | 12 | 3.5 | M4 x 0.7 |
| 15 | 12 | 27 | 31 | 7 | 16.5 | 22.5 | 29 | 19 | 14 | 4.2 | M5 x 0.8 |

| Bore size (mm) | NN | R | S | | | W | Z | | | Q |
|----------------|-----------|----|-----------------|------------------|------------------|---|-----------------|------------------|------------------|---|
| | | | 5 st | 10 st | 15 st | | 5 st | 10 st | 15 st | |
| 4 | M8 x 1.0 | 7 | 16 | 24 | 32 | 3 | 23.5 | 31.5 | 39.5 | 2 |
| 6 | M10 x 1.0 | 9 | 18.5 | 25.5 | 32.5 | 3 | 27.5 | 34.5 | 41.5 | 3 |
| 10 | M15 x 1.5 | 13 | 20.5 | 27 | 34 | 4 | 32.5 | 39 | 46 | 5 |
| 15 | M22 x 1.5 | 20 | 23.5 | 29.5 | 36 | 5 | 37.5 | 43.5 | 50 | 6 |

⚠ Specific Product Precautions

Be sure to read this before handling. Consult with SMC for the use other than the specifications.

Piping

⚠ Caution

The fittings below are recommended for connecting this cylinder to piping.

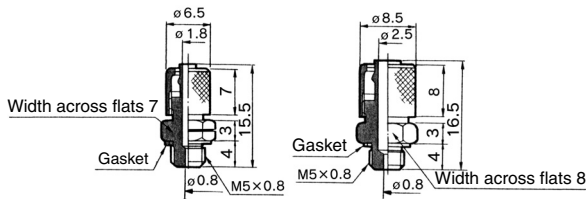
| Cylinder bore size | Applicable bore size | Fitting type | Connection thread | Model |
|--------------------|----------------------|---|-------------------|-----------------|
| ø4 | ø2 | One-touch fitting | M3 x 0.5 | KJ□02-M3 |
| | | Miniature fitting | | M-3AU-2 |
| ø6 ø10 ø15 | | One-touch fitting | M5 x 0.8 | KJ□02-M5 |
| | | Miniature fitting | | M-5AU-2 |
| | ø4/2.5 | Dedicated hose nipple (with fixed orifice) | | CJ-5H-4 |
| | ø6/4 | | | CJ-5H-6 |

* Please be aware that cylinder speed may slow down on the retracting side when using the above one-touch fittings and miniature fittings with a cylinder bore size of ø15.

Hose nipple

CJ-5H-4
(For ø4/ø2.5 tubing)

CJ-5H-6
(For ø6/ø4 tubing)



In addition to the above fittings and hose nipples, the below fittings can also be attached to the cylinder. When using the below fittings be sure to provide a speed controller after adjusting it to 500 mm/s or less.

| Cylinder bore size | Applicable bore size | Fitting type | Connection thread | Model |
|--------------------|----------------------|-------------------|-------------------|-----------------|
| ø4 | 3.2 | One-touch fitting | M3 x 0.5 | KJ□23-M3 |
| | 4 | | | KJ□04-M3 |
| ø6 | 3.2 | | M5 x 0.8 | KJ□23-M5 |
| ø10 | 4 | | | KJ□04-M5 |
| ø15 | 6 | | | KJ□06-M5 |

Recommended Speed Controller

| Applicable bore size | Connection thread | Elbow type meter-in | Universal type meter-in | In-line type meter-in |
|----------------------|-------------------|---------------------|-------------------------|-----------------------|
| ø2 | M3 | AS1211F-M3-02 | — | AS1001F-02 |
| | M5 | AS1211F-M5-02 | — | |
| ø3.2 | M3 | AS1211F-M3-23 | AS1311F-M3-23 | AS1001F-23 |
| | M5 | AS1211F-M5-23 | AS1311F-M5-23 | |
| ø4 | M3 | AS1211F-M3-04 | AS1311F-M3-04 | AS1001F-04 |
| | M5 | AS1211F-M5-04 | AS1311F-M5-04 | |
| ø6 | M5 | AS1211F-M5-06 | AS1311F-M5-06 | AS1001F-06 |

* For details about one-touch fittings, miniature fittings and speed controllers (applicable tubing O.D. ø2 only), refer to the catalog ES50-25 (B edition or later). Also, for details about speed controllers (applicable tubing O.D. ø3.2 to ø6), refer to "Best Pneumatics 2004" Vol. 15 catalog.

Mounting

⚠ Caution

Do not use it in such a way that a load could be applied to the piston rod during the retraction. The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod will not be able to retract to the end of the stroke.

Auto Switch Specifications

Auto Switch Common Specifications

| Type | Reed switch | Solid state switch |
|-----------------------|---|--|
| Leakage current | None | 3-wire: 100 A or less 2-wire: 0.8 mA or less |
| Operating time | 1.2 ms | 1 ms or less |
| Impact resistance | 300 m/s ² | 1000 m/s ² |
| Insulation resistance | 50 M or more at 500 Mega VDC (between lead wire and case) | |
| Withstand voltage | 1000 VAC for 1 minute (between lead wire and case) | 1000 VAC for 1 minute (between lead wire and case) |
| Ambient temperature | -10 to 60°C | |
| Enclosure | IEC529 standard IP67, JIS C 0920 waterproof construction | |
| Standard | Conforming to CE Standards | |

Lead Wire Length

Lead wire length indication

(Example) D-M9P **L**

Lead wire length

| | |
|-----|-------|
| Nil | 0.5 m |
| M | 1 m |
| L | 3 m |
| Z | 5 m |

Note 1) Applicable auto switch with 5 m lead wire "Z"

Solid state switch: Manufactured upon receipt of order as standard.

Note 2) For 1 m(M), D-M9□W(V) only.

Contact Protection Boxes: CD-P11, CD-P12

<Applicable switch model>

D-A9/A9□V

The auto switches below do not have a built-in contact protection circuit. Therefore, please use a contact protection box with the switch for any of the following cases:

- ① Where the operation load is an inductive load.
- ② Where the wiring length to load is greater than 5 m.
- ③ Where the load voltage is 100 VAC.

The contact life may be shortened. (Due to permanent energizing conditions.)

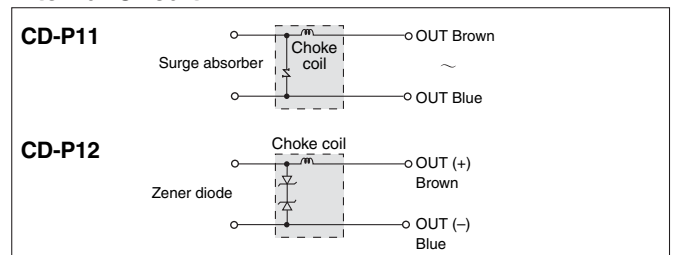
Specifications

| Part no. | CD-P11 | | CD-P12 |
|----------------------|---------|---------|--------|
| Load voltage | 100 VAC | 200 VAC | 24 VDC |
| Maximum load current | 25 mA | 12.5 mA | 50 mA |

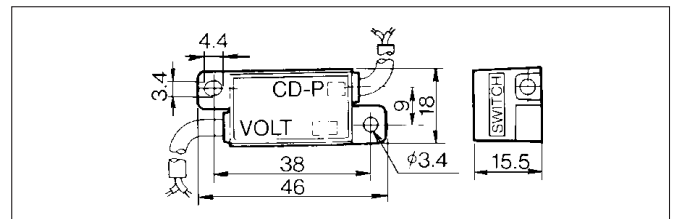
* Lead wire length — Switch connection side 0.5 m
Load connection side 0.5 m



Internal Circuit



Dimensions



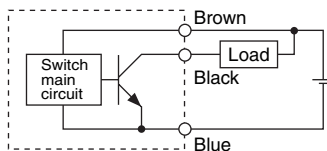
Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box, with a lead wire length of no more than 1 meter.

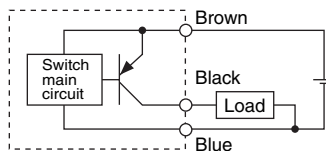
Auto Switch Connections and Examples

Basic Wiring

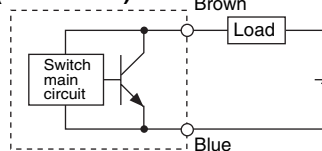
Solid state 3-wire, NPN



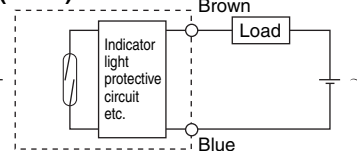
Solid state 3-wire, PNP



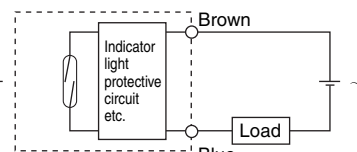
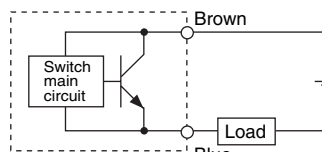
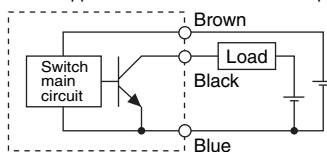
2-wire (Solid state)



2-wire (Reed)

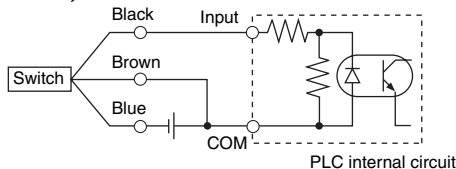


(Power supplies for switch and load are separate.)

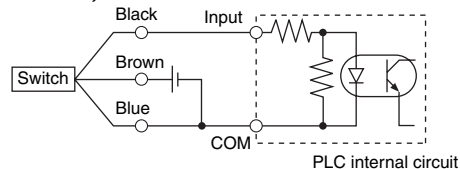


Example of Connection to PLC (Programmable Logic Controller)

• Sink input specification 3-wire, NPN

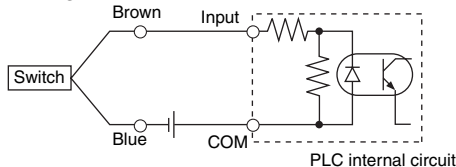


• Source input specification 3-wire, PNP

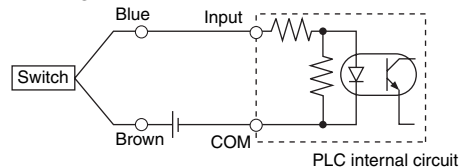


Connect according to the applicable PLC input specifications, since the connection method will vary depending on the PLC input specifications.

2-wire



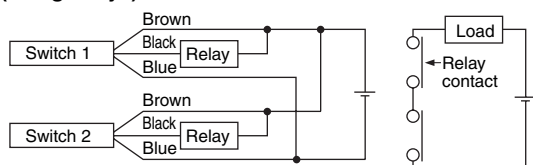
2-wire



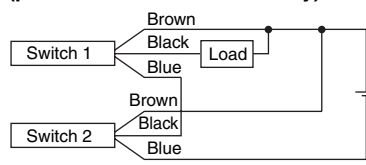
Example of AND (Serial) and OR (Parallel) Connection

• 3-wire

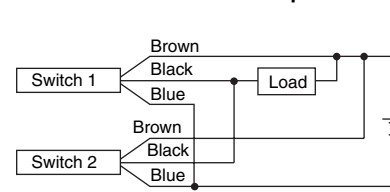
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

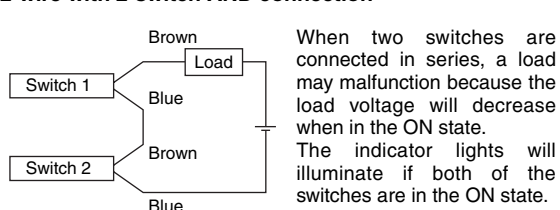


OR connection for NPN output



The indicator lights will illuminate when both switches are turned ON.

2-wire with 2-switch AND connection

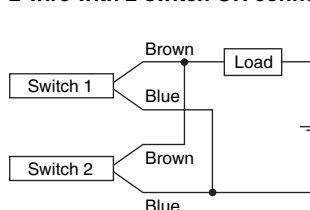


When two switches are connected in series, a load may malfunction because the load voltage will decrease when in the ON state. The indicator lights will illuminate if both of the switches are in the ON state.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply is 24 VDC.
Internal voltage drop in switch is 4 V.

2-wire with 2-switch OR connection



(Solid state)

When two switches are connected in parallel, a malfunction may occur because the load voltage will increase when in the OFF state.

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \\ &\quad \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k} \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 k.
Leakage current from switch is 1 mA.

(Reed)

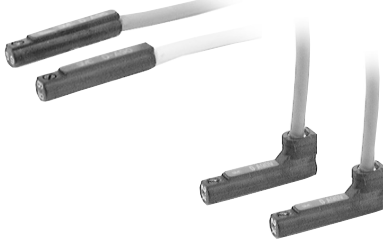
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes dim or not light because of the dispersion and reduction of the current flowing to the switches.

Reed Switch: Direct Mounting Style

D-A90(V)/D-A93(V)/D-A96(V)



Grommet



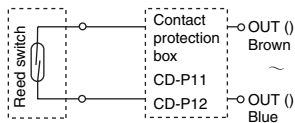
Caution

Operating Precautions

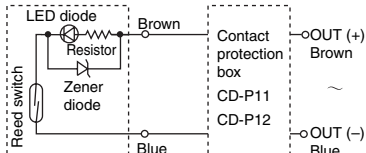
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

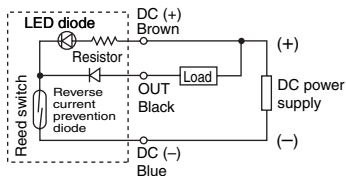
D-A90(V)



D-A93(V)



D-A96(V)



- Note) ① In a case where the operation load is an inductive load.
 ② In a case where the wiring load is greater than 5 m.
 ③ In a case where the load voltage is 100 VAC.

Use the auto switch with a contact protection box in any of the above mentioned cases. (For details about the contact protection box, refer to page 17.)

Auto Switch Specifications



For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

| D-A90/D-A90V (Without indicator light) | | | | | | |
|--|---|---------------|-------------------|---------------|--------------------|---------------|
| Auto switch part no. | D-A90 | D-A90V | D-A90 | D-A90V | D-A90 | D-A90V |
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Applicable load | IC circuit, Relay, PLC | | | | | |
| Load voltage | 24 VAC/DC or less | | 48 VAC/DC or less | | 100 VAC/DC or less | |
| Maximum load current | 50 mA | | 40 mA | | 20 mA | |
| Contact protection circuit | None | | | | | |
| Internal resistance | 1 or less (including lead wire length of 3 m) | | | | | |
| D-A93/D-A93V/D-A96/D-A96V (With indicator light) | | | | | | |
| Auto switch part no. | D-A93 | D-A93V | D-A93 | D-A93V | D-A96 | D-A96V |
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Applicable load | Relay, PLC | | | | IC circuit | |
| Load voltage | 24 VDC | | 100 VAC | | 4 to 8 VDC | |
| Load current range and max. load current | 5 to 40 mA | | 5 to 20 mA | | 20 mA | |
| Contact protection circuit | None | | | | | |
| Internal voltage drop | D-A93 — 2.4 V or less (to 20 mA)/3 V or less (to 40 mA) D-A93V — 2.7 V or less | | | | 0.8 V or less | |
| Indicator light | Red LED illuminates when ON. | | | | | |
| Standard | Conforming to CE Standards | | | | | |

Lead wires

D-A90(V)/D-A93(V) — Oilproof heavy-duty vinyl cable: $\phi 2.7$, 0.18 mm² x 2 cores (Brown, Blue), 0.5 m

D-A96(V) — Oilproof heavy-duty vinyl cable: $\phi 2.7$, 0.15 mm² x 3 cores (Brown, Black, Blue), 0.5 m

Note 1) Refer to page 17 for reed switch common specifications.

Note 2) Refer to page 17 for lead wire lengths.

Weight

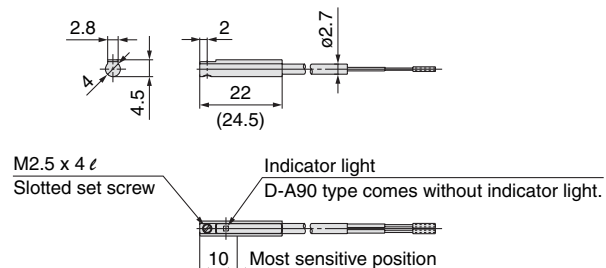
Unit: g

| Auto switch part no. | D-A90(V) | D-A93(V) | D-A96(V) |
|------------------------|----------|----------|----------|
| Lead wire length 0.5 m | 6 | 6 | 8 |
| Lead wire length 3 m | 30 | 30 | 41 |

Dimensions

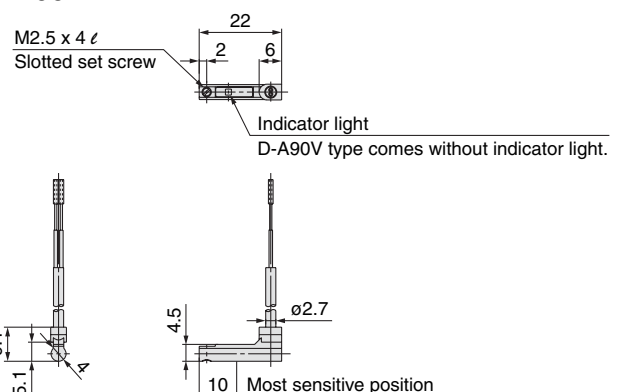
Unit: mm

D-A90/D-A93/D-A96



(): dimensions for D-A93.

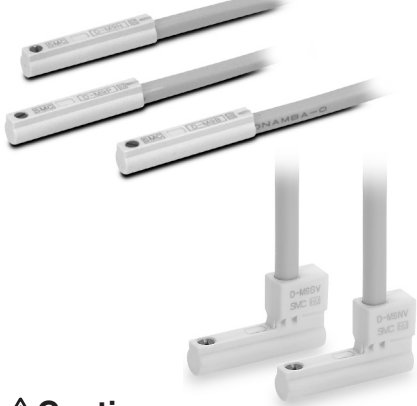
D-A90V/D-A93V/D-A96V



Solid State Switch: Direct Mounting Style D-M9N(V)/D-M9P(V)/D-M9B(V) C €

Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Lead free
- UL certified (style 2844) lead cable is used.
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.



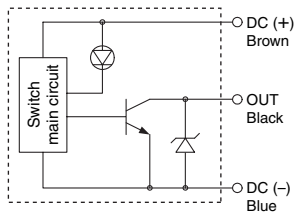
⚠ Caution

Operating Precautions

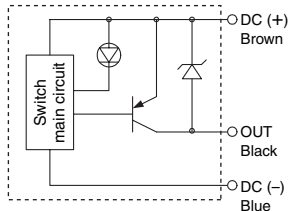
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

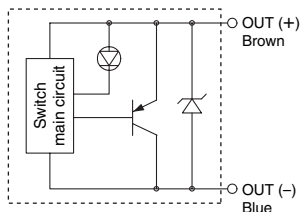
D-M9N(V)



D-M9P(V)



D-M9B(V)



Auto Switch Specifications



For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

D-M9□/D-M9□V (With indicator light)

| Auto switch part no. | D-M9N | D-M9NV | D-M9P | D-M9PV | D-M9B | D-M9BV |
|----------------------------|------------------------------|---------------|---------|---------------|-----------------------|---------------|
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Wiring type | 3-wire | | | | 2-wire | |
| Output type | NPN | | PNP | | — | |
| Applicable load | IC circuit, Relay, PLC | | | | 24 VDC relay, PLC | |
| Power supply voltage | 5, 12, 24 VDC (4.5 to 28 V) | | | | — | |
| Current consumption | 10 mA or less | | | | — | |
| Load voltage | 28 VDC or less | | — | | 24 VDC (10 to 28 VDC) | |
| Load current | 40 mA or less | | | | 2.5 to 40 mA | |
| Internal voltage drop | 0.8 V or less | | | | 4 V or less | |
| Leakage current | 100 A or less at 24 VDC | | | | 0.8 mA or less | |
| Indicator light | Red LED illuminates when ON. | | | | | |
| Standard | Conforming to CE Standards | | | | | |

● Lead wires

Oilproof heavy-duty vinyl cable: $\phi 2.7 \times 3.2$ ellipse

D-M9B(V) 0.15 mm² x 2 cores

D-M9N(V), D-M9P(V) 0.15 mm² x 3 cores

Note 1) Refer to page 17 for solid state switch common specifications.

Note 2) Refer to page 17 for lead wire lengths.

Weight

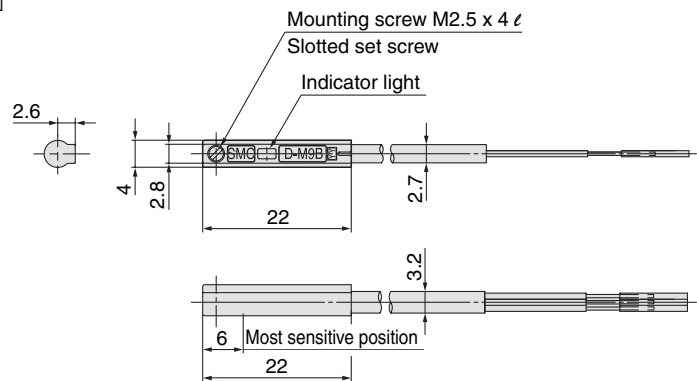
Unit: g

| Auto switch part no. | | D-M9N(V) | D-M9P(V) | D-M9B(V) |
|----------------------|-----|----------|----------|----------|
| Lead wire length (m) | 0.5 | 8 | 8 | 7 |
| | 3 | 41 | 41 | 38 |
| | 5 | 68 | 68 | 63 |

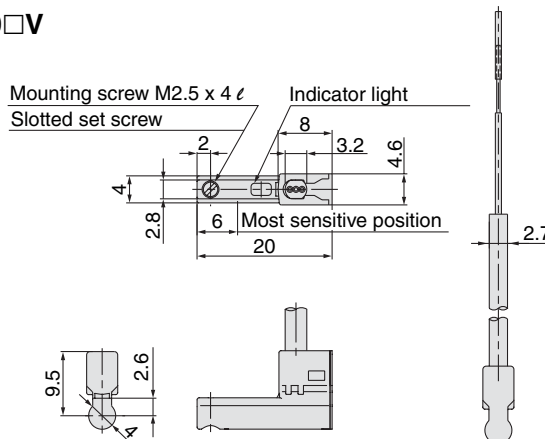
Dimensions

Unit: mm

D-M9□



D-M9□V



2-Color Indication Solid State Switch: Direct Mounting Style

D-M9NW(V)/D-M9PW(V)/D-M9BW(V) C €

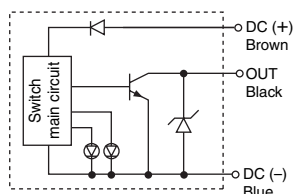
Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- RoHS compliant
- UL certified (style 2844) lead cable is used.
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.
- The optimum operating position can be determined by the color of the light. (Red → Green → Red)

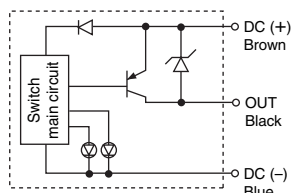


Auto Switch Internal Circuit

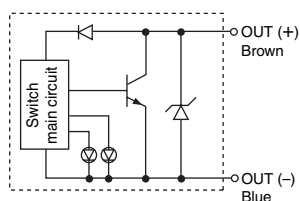
D-M9NW(V)



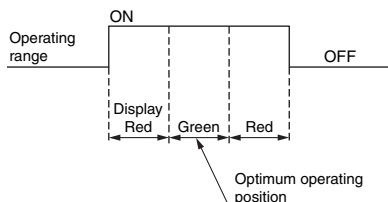
D-M9PW(V)



D-M9BW(V)



Indicator light / Display method



Auto Switch Specifications



For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Programmable Logic Controller

| D-M9□W/D-M9□WV (With indicator light) | | | | | | |
|---------------------------------------|--|---------------|---------|---------------|-----------------------|---------------|
| Auto switch part no. | D-M9NW | D-M9NWV | D-M9PW | D-M9PWV | D-M9BW | D-M9BWV |
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Wiring type | 3-wire | | | | 2-wire | |
| Output type | NPN | | PNP | | — | |
| Applicable load | IC circuit, Relay IC, PLC | | | | 24 VDC relay, PLC | |
| Power supply voltage | 5, 12, 24 VDC (4.5 to 28 VDC) | | | | — | |
| Current consumption | 10 mA or less | | | | — | |
| Load voltage | 28 VDC or less | | — | | 24 VDC (10 to 28 VDC) | |
| Load current | 40 mA or less | | | | 2.5 to 40 mA | |
| Internal voltage drop | 0.8 V or less at 10 mA (2 V or less at 40 mA) | | | | 4 V or less | |
| Leakage current | 100 A or less at 24 VDC | | | | 0.8 mA or less | |
| Internal voltage drop | Operating position Red LED illuminates. Optimum operating position Green LED illuminates. | | | | | |
| Standard | Conforming to CE Standards | | | | | |

● Lead wires

Oilproof heavy-duty vinyl cable: $\phi 2.7 \times 3.2$ ellipse

D-M9BW(V) 0.15 mm² x 2 cores

D-M9NW(V), D-M9PW(V) 0.15 mm² x 3 cores

Note 1) Refer to page 17 for solid state switch common specifications.

Note 2) Refer to page 17 for lead wire lengths.

Weight

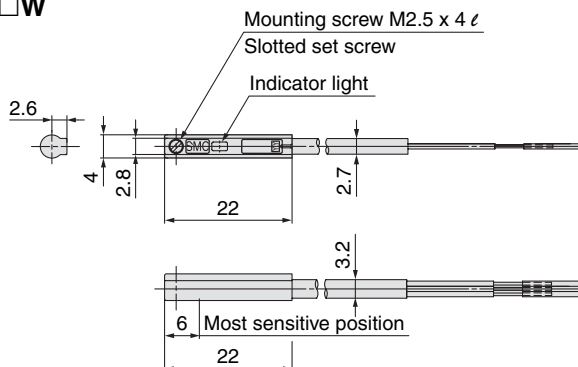
Unit: g

| Auto switch part no. | D-M9NW(V) | D-M9PW(V) | D-M9BW(V) |
|----------------------|-----------|-----------|-----------|
| Lead wire length (m) | | | |
| 0.5 | 8 | 8 | 7 |
| 1 | 14 | 14 | 13 |
| 3 | 41 | 41 | 38 |
| 5 | 68 | 68 | 63 |

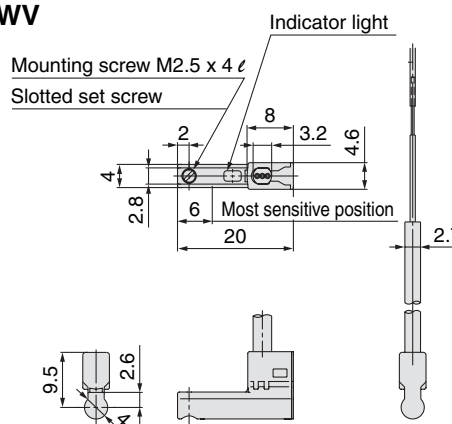
Dimensions

Unit: mm

D-M9□W



D-M9□WV



Series CJP2/CJP

Simple Specials: Made to Order

For detailed specifications, please contact SMC for detailed specifications, lead times, and prices.



Simple Specials

We apply the Simple Made to Order system to the below specials.
Contact your SMC representative for details.

| Symbol | Description | Double acting, Single rod CJP2 | Single acting, Single rod CJP | Bore size | |
|------------------|-------------------------|--------------------------------------|-------------------------------------|-----------|-----------|
| | | | | CJP2 | CJP |
| 1 XA0, 1, 10, 11 | Change of rod end style | ● | | ø6 to ø16 | ø6 to ø15 |

Made to Order

| | | | | | |
|--------|--------------------------------|---|---|----------------------------|-----------|
| 1 XB6 | Heat resistant cylinder (150C) | ● | | ø6 to ø16 ^{Note)} | — |
| 2 XB7 | Cold resistant cylinder | ● | | ø6 to ø16 ^{Note)} | — |
| 3 XC17 | Pin cylinder with rod quenched | | ● | — | ø6 to ø15 |
| 4 XC22 | Fluoro rubber seals | ● | ● | ø6 to ø16 | ø6 to ø15 |

Note) Except clevis, trunnion type, with switch.

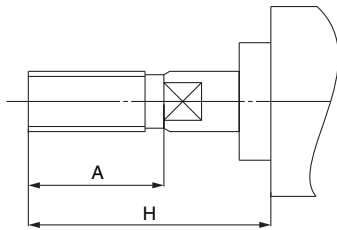
Simple Specials

1 Change of rod end style XA0, XA1, XA10, XA11

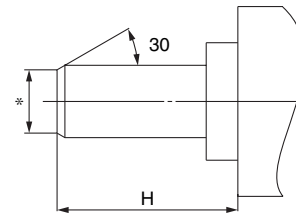
With the exception of standards, we pattern the rod-end configurations.

- SMC will make appropriate arrangements if no dimension, tolerance, or finish instructions are given in the diagram.
- Standard dimensions marked with “*” will be as follows to the rod diameter (D).
 $D \leq 6 \rightarrow D-1 \text{ mm}$ $6 < D \leq 25 \rightarrow D-2 \text{ mm}$ $D > 25 \rightarrow D-4 \text{ mm}$
- In the case of double rod and single acting retraction type, fill in the dimension when the rod is retracted.
- Only the single side of a double rod is able to manufacture.

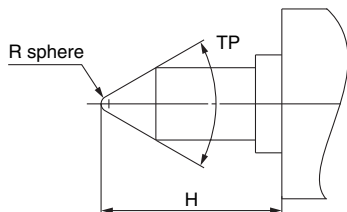
Symbol: A0



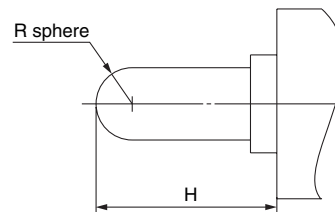
Symbol: A1



Symbol: A10



Symbol: A11



Series CJP2/CJP

Made to Order

For detailed specifications, please contact SMC for detailed specifications, lead times, and prices.



1 Heat Resistant Cylinder (−10 to 150C) **Symbol XB6**

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150C from −10C.

How to Order

CJP2 ^B _F _L Standard model no. — **XB6**
Heat resistant cylinder

Specifications

| | |
|---|-----------------------|
| Ambient temperature range | −10 to 150°C |
| Seals material | Fluoro rubber |
| Grease | Heat resistant grease |
| Specifications other than above and external dimensions | Same as standard. |



- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 3) It is impossible to make built-in magnet type and the one with auto switch.
 Note 4) Piston speed is ranged from 50 to 500 mm/s.

Warning

Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

2 Cold Resistant Cylinder **Symbol XB7**

Air cylinder which changed the seal material and grease, so that it could be used even at lower temperature down to −40C.

How to Order

CJP2 ^B _F _L Standard model no. — **XB7**
Cold resistant cylinder

Specifications

| | |
|---------------------------|-----------------------|
| Ambient temperature range | −40 to 70°C |
| Seals material | Low nitrile rubber |
| Grease | Cold resistant grease |
| Auto switch | Not mountable |
| Dimensions | Same as standard. |
| Additional specifications | Same as standard. |



- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Use dry air which is suitable for heatless air dryer, etc. not to cause the moisture to be frozen.
 Note 3) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 4) Mounting auto switch is impossible.

3 Pin Cylinder with Rod Quenched **Symbol XC17**

The carbon-steel piston rod is induction hardened and chromate surfaced.

How to Order

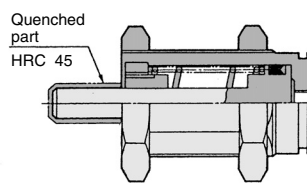
CJP Standard model no. — **XC17**
Rod quenched

Note) Additional symbol for “-B” (without thread) is unnecessary when indicating the model no.

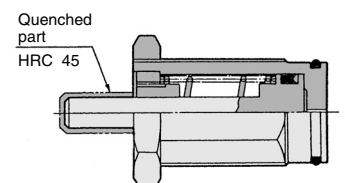
Specifications: Same as standard.

Construction (Dimensions are the same as standard.)

Panel mount type: CJPB



Embedded type: CJP



4 Fluoro Rubber Seals **Symbol XC22**

How to Order

CJP2 ^B _F _L Standard model no. — **XC22**
Fluoro rubber seals

Specifications

| | |
|---|---|
| Seal material | Fluoro rubber |
| Ambient temperature | With auto switch: −10 to 70°C (No freezing) ^{Note 1)} Without auto switch: −10 to 60°C (No freezing) ^{Note 1)} |
| Specifications other than above and external dimensions | Same as standard. |



- Note 1) Please confirm with SMC, as the type of chemical and the operating temperature may not allow the use of this product.
 Note 2) Cylinders with auto switches can also be produced; however, auto switch related parts (auto switch units, mounting bracket, built-in magnets) are the same as standard products. Before using these, please contact SMC regarding their suitability for the operating environment.






Series CJP2/CJP

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 ^{Note 1)}, JIS B 8370 ^{Note 2)} and other safety practices.

■Explanation of the Labels

| Labels | Explanation of the labels |
|--|--|
|  Danger | In extreme conditions, there is a possible result of serious injury or loss of life. |
|  Warning | Operator error could result in serious injury or loss of life. |
|  Caution | Operator error could result in injury ^{Note 3)} or equipment damage. ^{Note 4)} |

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalization or hospital visits for long-term medical treatment.

Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

■Selection/Handling/Applications

1. The compatibility of the pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or post analysis and/or tests to meet the specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators. (Understanding JIS B 8370 General Rules for Pneumatic Equipment, and other safety rules are included.)

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is removed, confirm that safety process as mentioned above. Turn off the supply pressure for this equipment and exhaust all residual compressed air in the system, and release all the energy (liquid pressure, spring, condenser, gravity).
3. Before machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

4. Contact SMC if the product will be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, requiring special safety analysis.
4. If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. And, examine the devices periodically if they function normally or not.

■Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.
2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits, or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.
3. SMC is exempted from liability for any damages caused by operations not contained in the catalogs and/or instruction manuals, and operations outside of the specification range.
4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.



Series CJP2 Auto Switches Precautions 1

Be sure to read this before handling.

Design and Selection

Warning

1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact. We do not guarantee any damage in any case the product is used outside of the specification range.

2. Keep wiring as short as possible.

<Reed switch>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.) Use a contact protection box when the wire length is 5 m or longer.

<Solid state switch>

Although wire length should not affect switch function, use a wire 100 m or shorter.
If the wiring is longer it will likely increase noise although the length is less than 100 m.
When the wire length is long, we recommend attaching the ferrite core to the both ends of the cable to prevent excess noise.

3. Do not use a load that generates surge voltage. If a surge voltage is generated, the discharge occurs at the contact, possibly resulting in the shortening of product life.

<Reed switch>

If driving a load such as a relay that generates a surge voltage, use a contact protection box.

<Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if the surge is applied repeatedly. When a load, such as a relay or solenoid, which generates surge is directly driven, use a type of switch with a built-in surge absorbing element.

4. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic maintenance and confirm proper operation.

5. Do not make any modifications to the product.

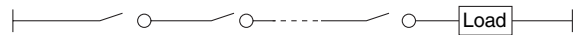
Do not take the product apart. It may cause human injuries and accidents.

Caution

1. Take note of the internal voltage drop of the switch.

<Reed switch>

- 1) Switches with an indicator light (Except D-A96, A96V)
 - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)
[The voltage drop will be "n" times larger when "n" auto switches are connected.]
Even though an auto switch operates normally, the load may not operate.



- In the same way, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

- 2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model D-A90, A90V).

<Solid state switch>

- 3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1).
Also, note that a 12 VDC relay is not applicable.

2. Pay attention to leakage current.

<Solid state switch>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

$$\text{Operating current of load (OFF condition)} > \text{Leakage current}$$

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3-wire switch if this specification will not be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

3. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

4. Minimum stroke for auto switch mounting

The minimum stroke value for mounting one or two auto switches is obtained when the switch can detect at the cylinder stroke ends.

However, even if the switch is mounted at the proper position within the minimum stroke range, it may not be able to detect when the piston stops in the middle of the stroke due to a stopper, etc. It may also turn on in the middle of a stroke.



Series CJP2 Auto Switches Precautions 2

Be sure to read this before handling.

Design and Selection

Warning

5. Use the cylinder and switch in proper combination.

The auto switch is pre-adjusted to activate properly for an auto-switch-capable SMC cylinder.

If the auto switch is mounted improperly, used for another brand of cylinder or used after the alternation of the machine installation, the switch may not activate properly.

Mounting and Adjustment

Warning

1. Instruction manual

Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

2. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300 m/s² or more for reed switches and 1000 m/s² or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

3. Mount switches using the proper fastening torque.

When a switch is tightened beyond the range of fastening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below the range of fastening torque may allow the switch to slip out of position.

4. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting position shown in a catalog indicates the optimum position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable or the service life will be shortened.

<D-M9□(V)>

When the D-M9□(V) auto switch is used to replace old series auto switch, it may not activate depending on operating condition because of its shorter operating range.

Such as

- Application where the stop position of actuator may vary and exceed the operating range of the auto switch, for example, pushing, pressing, clamping operation, etc.
- Application where the auto switch is used for detecting an intermediate stop position of the actuator. (In this case the detecting time will be reduced.)

In these applications, set the auto switch to the center of the required detecting range.

Caution

1. Do not carry an actuator by the auto switch lead wires.

Never carry a cylinder (actuator) by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

2. Fix the switch with appropriate screw installed on the switch body. If using other screws, switch may be damaged.

Wiring

Warning

1. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

2. Do not wire with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits, including auto switches, may malfunction due to noise from these other lines.

Caution

1. Avoid repeatedly bending or stretching lead wires.

It will result in a broken lead wire. Especially when the auto switch is used with a trunnion bracket and bending stress is repeatedly applied to the lead wire, affix the lead wire near the switch to give it an approximate bending radius of more than R40 to R80 mm.

Also, if bending or stretching force is applied to the connection between the lead wire and the switch, the sheath may be peeled or result in a broken lead wire. Be careful not to apply excessive force to the connection.

2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

It is the same as when the 2-wire brown cord (+, output) is directly connected to the (+) power supply terminal.

3. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>

Model D-M9□(V) and all models of PNP output type switches do not have built-in short circuit prevention circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.

Take special care to avoid reverse wiring with the power supply line (brown) and the output line (black) on 3-wire type switches.



Series CJP2 Auto Switches Precautions 3

Be sure to read this before handling.

Wiring

⚠ Caution

4. Avoid incorrect wiring.

<Reed switch>

A 24 VDC switch with indicator light has polarity. The brown lead wire is (+) and the blue lead wire is (–).

- 1) If connections are reversed, a switch will operate, however, the light emitting diode will not light up.

Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

Applicable models:

D-A93, D-A93V

<Solid state switch>

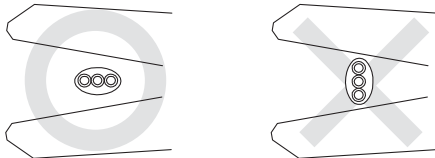
- 1) If connections are reversed on a 2-wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will always stay in an ON state. However, it is still necessary to avoid reversed connections, since the switch could be damaged by a load short circuit in this condition.

- 2) If connections are reversed (power supply line + and power supply line –) on a 3-wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue wire and the power supply line (–) is connected to the black wire, the switch will be damaged.

<D-M9□(V)>

D-M9□(V) does not have built-in short circuit protection circuit. Be aware that if the power supply connection is reversed (e.g. (+) power supply wire and (–) power supply wire connection is reversed), the switch will be damaged.

5. When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction. (D-M9□(V) only)



Recommended Tool

| Model name | Model no. |
|---------------|-----------|
| Wire stripper | D-M9N-SWY |

* Stripper for a round cable (ø2.0) can be used for a 2-wire type cable.

Operating Environment

⚠ Warning

1. Never use in an atmosphere of explosive gases.

The construction of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside actuators will become demagnetized.

3. Do not use in an environment where the auto switch will be in water or continually exposed to water.

Although switches satisfy IEC standard IP67 construction (JIS C 0920: waterproof construction), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

4. Do not use in an environment with oil or chemicals.

Consult with SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult with SMC if switches are used where there are temperature cycles other than normal temperature changes, as they may be adversely affected internally.

6. Do not use in an environment where there is excessive impact shock.

<Reed switch>

When excessive impact (300 m/s² or more) is applied to a reed switch during operation, the contact point will malfunction and generate or cut off a signal momentarily (1 ms or less). Consult with SMC regarding the need to use a solid state switch depending upon the environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (solenoid type lifter, high frequency induction furnace, motor, radio equipment etc.) which generate large surges or electromagnetic waves in the area around actuators with solid state auto switches, this may cause deterioration or damage to the switches. Avoid sources of surge generation and crossed lines.



Series CJP2 Auto Switches Precautions 4

Be sure to read this before handling.

Operating Environment

Caution

1. Avoid accumulation of iron debris or close contact with magnetic substances.

When a large amount of ferrous debris such as machining chips or spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch actuator, it may cause the auto switch (actuator) to malfunction due to a loss of the magnetic force inside the actuator.

2. Consult with SMC concerning water resistance, elasticity of lead wires, usage at welding sites, etc.

3. Do not use in direct sunlight.

4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

Warning

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.

3) Confirm the lighting of the green light on the 2-color indicator type switch.

Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

2. Maintenance procedures are outlined in the operation manual.

Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

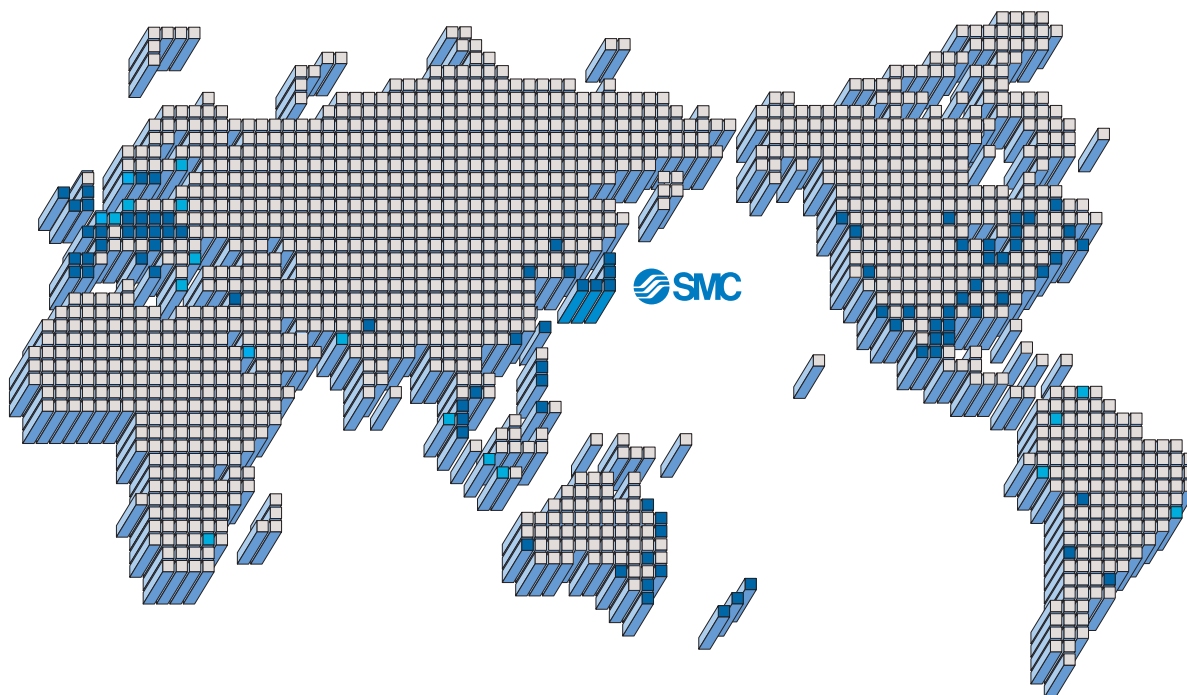
3. Removal of equipment, and supply/exhaust of compressed air

Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent actuators from sudden movement.



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Safety Instructions

Be sure to read "Precautions for Handling Pneumatic Devices" (M-03-E3A) before using.

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 FAX: 03-5298-5362
URL <http://www.smcworld.com>
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